ASSESSMENT OF HEALTH PERCEPTION PREDICTORS: AN APPLICATION OF GROSSMAN'S MODEL TO THE PORTUGUESE POPULATION

by

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BRIEF BIOGRAPHICAL INFORMATION

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This work is dedicated to all of you

ABSTRACT

Although Portugal has faced large gains in terms of health during the last half century, due to the presence of diminishing marginal returns the health production is reaching a situation in which is necessary to expend a considerable amount of resources to obtain small increments in terms of health, from a population perspective. The purpose of this study is to estimate a health production function for adult Portuguese population, evidencing the impact of biological, socioeconomic and medical care factors on the health status. Using data collected from the EPIPorto project, a population-based study in progress for about 15 years, consisting in a cohort of adults living in a large urban center in the north-west of Portugal, we try to determine the most efficient way of allocating limited resources for improving the overall health status. As indicator of health output, we use self-reported general health, more specifically, the variable GHP (General Health Perceptions) derived from the SF-36, a multi-purpose, short-form health survey designed for health policy evaluations, clinical practice and research. Our results indicate some statistically significant variables as significant estimators of health perception, with particular emphasis on age and daily sleeping hours whose increase is associated with lower health perception. We also found significant correlations between health perception and the individuals' occupation, marital status, alcohol intake, physical activity and the type of medical facility they usually attended. These findings provide a more refined picture which allows a better understanding of the factors that affect the health condition of Portuguese individuals, representing a possible starting point in developing worthwhile health policies, directed toward improving the health status. Moreover, future research on the topic should review the particularities of this specific population.

KEYWORDS:

Grossman's model, Health Production, Health Status, Human capital

JEL CLASSIFICATION:

C51, C89, I100, I120, I180, I190.

RESUMO

Embora em Portugal se tenham verificado grandes ganhos em termos de saúde durante o último meio século, devido à presença de rendimentos marginais decrescentes a produção de saúde está a atingir uma situação em que é necessário gastar uma quantidade considerável de recursos para obter pequenos incrementos em termos de saúde, numa perspectiva populacional. O objetivo deste estudo é estimar uma função de produção de saúde para população adulta Portuguesa, evidenciando o impacto dos fatores biológicos, socioeconómicos e de cuidados médicos sobre o estado de saúde. Usando dados coletados do projeto EPIPorto, um estudo de base populacional em curso há cerca de 15 anos, que consiste numa coorte de adultos que vivem num grande centro urbano do noroeste de Portugal, tentamos determinar a forma mais eficiente de alocar recursos limitados para a melhoria do estado geral de saúde. Como proxy do estado de saúde, usamos a saúde geral auto-reportada, mais especificamente, a variável GHP (Percepções sobre a Saúde Geral) derivada do SF-36, um breve questionário de saúde multi-propósito, concebido para avaliações de políticas de saúde, prática clínica e investigação. Os nossos resultados indicam algumas variáveis como estimadores significativos de percepção de saúde, com especial ênfase para a idade e horas de sono diárias cujo aumento está associado a uma menor percepção de saúde. Foram também obtidas correlações significativas entre a percepção de saúde e a ocupação dos indivíduos, estado civil, consumo de álcool, atividade física e infraestrura de cuidados de saúde a que recorrem. Estes achados fornecem uma imagem mais refinada que permite uma melhor compreensão dos fatores que afetam o estado de saúde de indivíduos portugueses, representando um possível ponto de partida para o desenvolvimento de políticas de saúde compensatórias, direccionadas para a melhoria do estado de saúde. Investigação futura sobre o tema deve analisar as particularidades desta população específica.

PALAVRAS-CHAVE:
Estado de Saúde, Capital Humano, Modelo de Grossman, Produção de Saúde

CLASSIFICAÇÃO JEL:
C51, C89, I100, I120, I180, I190.

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ACRONYMS AND ABBREVIATIONS

ACSS	Healthcare System Central Administration, "Administração Central do Sistema de Saúde"
BMI	Body Mass Index
CSDH	Commission on Social Determinants of Health
DEA	Data Development Analysis
DEPS	Department of Studies and Planning in Health
EAP	European Action Plan
EPHOs	Essential Public Health Operations
EPEPP	Profile of the Aging of the Portuguese Population, "Estudo do Perfil de Envelhecimento da População Portuguesa"
FMO	Financial Mechanism Office
GHP	General Health Perceptions
GIS	Geographic Information System
HRQL	Health Related Quality of Life
INE	National Institute of Statistics
INS	National Health Survey, "Inquérito Nacional de Saúde"
INSA	National Institute of Health Dr. Ricardo Jorge "Instituto Nacional de Saúde Dr. Ricardo Jorge"
LBS	Basic Law on Health, "Lei de Bases da Saúde"
MBHC	Marginal Benefits of Health Capital
MCHC	Marginal Cost of Health Capital
MET	Metabolic Equivalent
MLRM	Multiple Linear Regression Model
MOS	Medical Outcomes Study
NCHS	National Center for Health Statistics
OECD	Organization for Economic Cooperation and Development
SF-36	36-Item Short Form Health Survey
SNS	National Health Service "Serviço Nacional de Saúde"
SPSS	Statistical Package for the Social Sciences
TPC	Total Product Curve
USA	United States of America
VIF	Variance Inflation Factor
WHO	World Health Organization

1. INTRODUCTION

Over time there has been an effort to identify causes of health phenomena's, following mainly two lines: one of them concerns the way of thinking and the fundamentals required to infer causality (way of conceptualizing causes), the other have to do with the type of evidence from the "reality" that is used as one of the formal foundations of the causal judgment. Although their different nature justifies their separate mention, these two aspects have evolved in parallel with an intricate dynamic. In this sense, health economists have long been interested in the impact of a several amount of factors on health outcomes. Health determinants are diverse in nature and can be categorized in many different ways. A relatively large number of studies have examined the marginal contribution of selected environmental, socioeconomic, behavioural, and medical inputs on various measures of health outcomes using the individual as the unit of analysis.[1] To investigate these relationships, empirical studies have adopted a health production function analytical framework, where health is viewed as an output that is produced by a set of inputs. The major advantages of estimating an aggregate health production function is that estimates of the over-all effect of medical care utilization on the health status of the population can be obtained. This information can help policy makers and practitioners in their search for cost effective mechanisms for providing health services and the reallocation of health resources in such a way that the gains from health spending could be optimized.

In line with this, using the words spoken in Beijing (China) by Dr. Margaret Chan, the Director-General of World Health Organization (WHO), during the launch of the World Health Report 2013: Research for universal health coverage, although "…health depends on having access to medical services and a means of paying for these services, it is also strongly shaped by a wide range of social and environmental determinants", and so, "the research agenda for universal coverage, especially with preventive services, must address these determinants as well." The WHO head calls for "closer collaboration between researchers and policy-makers, who tend to work in

[1] For instance, Kirch (2008) suggests 4 categories: demographic and social (cultural, political, gender, socio-economic factors and community capacity), physical environment (living and working), individual dimensions (genetic legacy and behaviors) and access to healthcare.

parallel, with too little understanding of each other's priorities and methods", because "…while some research has broad application, many problems need "local solutions investigated through local research". Therefore, it is our intent with this study, to answer this appeal by exploring the situation for Portugal.

Over the last years, Portuguese health indicators improved a lot. For example, Portugal has been classified as one of the top five countries in the world that have made remarkable progress in reducing mortality rates.[2] Better access to an expanding health care network, thanks to continued political commitment, and economic growth, made it possible to invest large amounts in the health care sector.[3] The enhancement of Portuguese population health status can be partly explained by increases in human, material and financial resources devoted to health care (more recently due to the evolution of the primary and long-term care networks, additionally to the recent enforcement of the National Health Plan), as well as to a general improvement in socioeconomic conditions.[4] Anyway, despite the overall improvement in living standards and the enlargement and enrichment of the health concept inherent to the paradigm of an informed society, deep knowledge gaps still exist with regard to the health status of the population.

This work aims to estimate a health production function for Portuguese population on the ground of Grossman's theoretical model. The model treats biological, socioeconomic, and medical care factors as inputs of the production system. Several modifications are made to generalize and improve the analysis, specifically the incorporation of additional health related factors. From the health production perspective, it attempts to quantify the effect of individual health input consumption on a health measure, in this case health perception. Moreover, this paper will bring up evidence on the combined impact of health and several policies.

[2] The others are Chile, Malaysia, Thailand and Oman (WHO and ACS, 2008).
[3] There are inequalities among regions and between social classes. These disparities are evident in the variation of some health indicators.
[4] In Europe and USA (United States of America), life expectancy at birth increased almost 50 years between XVIII and first half of XX centuries, more than 90 % of this improvement occurred before the discovery of the first antibiotic (1928), which leads to the conclusion that it is not only the technological or pharmaceutical advances but also health policies and social conditions that make a difference to greater survival in the world (Marques-Pinto, 2013).

In that sense we will use information based on the data collected from the EPIPorto project, which is a Portuguese population-based study in progress for about 15 years, consisting in a cohort of adults living in a large urban center in the north-west of the country.

The thesis is organized as follows. In section 2 the problem is contextualised by presenting a literature review of the subject updating the earlier research on this matter. Section 3 describes data and the econometric methodology to be followed in the estimation process. Section 4 presents the results of the descriptive analysis and of the econometric model, and is dedicated to the interpretation of the main findings and limitations of the study. In section 5, a summary and the main conclusions of the thesis are presented as well as future perspectives.

2. LITERATURE REVIEW

2.1 INTRODUCTION

The most widespread definition of "Health" will certainly be found in the preamble of the WHO Constitution in 1948[5]: "a state of complete physical, mental and social well-being and not merely the absence of disease or disability." Besides this definition being useful as a broad working model it has frequently been criticised as utopian (Seedhouse, 2001). Health has legal, social and economic implications of the states of health and disease. In this sense, health is a resource for performance and a dimension of quality of life. In turn, the quality of life is a holistic concept that brings together all the resources (social, individual and physical) that the individual requires for the achievement of his goals and aspirations and to meet his needs at different levels.[6]

Nevertheless, according to the CSDH (Commission on Social Determinants of Health) most health research (funding) remains overwhelmingly biomedically focused, whereas the largest health improvements arguably come from improvements in the social determinants of health.[7] Understanding health and the effectiveness of interventions requires a rich evidence base that includes both qualitative and quantitative data which needs to be judged on fitness for purpose rather than on the basis of strict traditional hierarchies of evidence (CSDH, 2008).

The occidental concept of disease and the English language include three terms, disease, illness, sickness, and three different realities interact with each other: the biophysical, psychological and social reality. These realities are expressed through different dimensions, ie "having a disease", "feeling sick" and "behave like sick", respectively. Illness and sickness, unlike disease, are not necessarily detected by biochemical indicators, and that is why some investigators view health and ill heath as a

[5] Preamble to the Constitution of the WHO as adopted by the International Health Conference, New York, 19-22 June 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948 (Grad, 2002).
[6] For a more comprehensive and critical overview of relevant sociological and psychological perspectives on health, and therefore increase awareness of the richness of approaches to research on health and disease please check the work published by Jones (1994), Cockerham (1995) and Stoebe (2000).
[7] In fact, many randomized controlled trials are often not practically and/or ethically feasible.

continuum along which individuals progress and regress (Ogden, 1996). Moreover, since the concept of "Disease" is culturally built, it is based on values that differ widely between individuals, which partly explain the difficulty of communication among interlocutors who often have not the same cultural background, conceptions, ethnotheories on health, practices and behaviours.[8] There are many examples from qualitative interview and quantitative survey research in economics, anthropology, psychology and sociology that illustrate cultural variations in relation to definitions and perceptions of, and actions towards, health and illness (Wolff and Langley, 1977; Zola, 1966). Therefore, a number of contextual factors such as the demographic situation and economic and social development affect the health of individuals and consequently the demand and supply for health (Ramos, 2004).

Theoretical perspectives have had a clear influence on the development of measurement strategies in relation to health status, HRQL (Health Related Quality of Life) and socio-demographic characteristics scales (de Bruin et al., 2000). Much of the research in this field has been quantitative, and based on structured survey techniques. However, it shows a great deal of inconsistency between different health behaviours and between attitudes and behaviour (Bowling, 2009).

Models of behaviour and behaviour change, in relation to literature on production of health, also need consideration. The most relevant ones are those which not only focus on intention and motivations to behave, self-efficacy, perceived control, and the timeliness of cues to the behaviour, but include de individual's level of information, perceived skills for the behaviour, positive affect towards it, consistency of the behaviour with self-image, and environment and societal barriers, including the role of social support and pressure (Elder et al., 1999).

The famous article "Uncertainty and the welfare economics of medical care", published by Kenneth Arrow in 1963 in the American Economic Review, conceptualizes for the first time, the distinct nature of the health sector. From that moment researchers started applying economics to issues, problems and phenomenas of

[8] Concerning sociological research on health, sociologists are divided into those who focus on developing a theoretical, academic discipline, and those who focus on applied research and analysis aiming to contribute to contemporary issues on health. See Straus (1957) and Jefferys (1996).

health. Currently there are several models that adopt a multifactor and interactive approach to health and disease.

Economic models of behaviour and econometric techniques are used to explain changes (or their absence) in the behaviour of different groups. Through these models, health economics plays an important role in refining policies of health promotion and improve the targeting to certain groups of individuals. According to Newhouse (1998), economic research on health behaviours has increased considerably in the last couple of decades. In fact, 50 % of USA health economists surveyed in 2005 reported studying "the behaviour of individuals" (Morrisey and Cawley, 2008).

For a health economist, the individual is the obvious unit of study when they intend to analyse decisions concerning the individual's health and health-related behaviours, which is consistent with the individualist paradigm usually applied to economic theory. Although health-related behaviours do not fully explain the amount of health produced, is certainly true that the individual faces a wide range of possibilities that influence his health (Bolin, 2011).

In addition to the influence that the individual has over his own health, health is also given by:

a) Individual's genetics;
b) Decisions made by others, over which the individual may or may not have influence;
c) Other variables entirely exogenous (for example, the environment in which the individual belongs).

Economics generally assumes that people are rational and forward looking. Activities that have long-term consequences are typically considered as investments. Therefore, improvements in health may increase the output not only through labour productivity, but also through the accumulation of capital.[9]

[9] A fully specified model of economic growth would be multidimensional, showing not only how inputs and technology affect output, but also how the growth rates of inputs and their productivity are themselves determined (Bloom, Canning, Sevilla, 2004).

The economic-theoretical framework for the reflection about human capital investment activities includes a wide range of behaviours. In this sense, the theory of human capital is an essential starting point.

2.2 HUMAN CAPITAL AND GROSSMAN'S MODEL

Several theoretical models try to explain the demand for health, highlighting mainly the behavioural model of Andersen (1968) and the economic models of Grossman (1972) and Zweifel (1981). More targeted to the individual's behaviour, the Andersen model seeks to explain the reasons behind the use of health services, while the models of Grossman, based on traditional consumer theory, and Zweifel, based on principal-agent theory, look at demand for health. In fact, one of the most important aspects introduced by the economic analysis was the distinction between "demand for health" and "demand for health care" by each individual.

When it was published in 1972 in the Journal of Political Economy, Michael Grossman's Model was a huge breakthrough in the field of health economics. The "demand for health" does not fall directly on the traditional theory of demand, where each consumer has a utility or preference function that allows him to choose between different combinations of goods and services in the market in order to maximize that function, since by searching those services the individual does not seek the service itself, but better health. The "demand for health" approach made by Grossman relies heavily on the theory of Human Capital that emerged in the late 50s, early 60s of the twentieth century, through works carried out mainly by a group of neo-classical economists from the Chicago school, including, among others, Edward Denison, Jacob Mincer, Milton Friedman, Theodore Schultz and Gary Becker. The latter published in 1964, "Human Capital: A Theoretical and Empirical Analysis, with special reference to Education", a reference work in studies about investments in employee training where the discussion is expanded with the development of the analysis on the family economy using the human capital theory as the basis of the research program (Becker, 1964).

Just after presenting the concept, studies on human capital spread rapidly, which reflected in an extraordinary impact on economic literature and educational policy action which led to its incorporation in educational expansion programs in the 60s, carried out in most OECD (Organization for Economic Cooperation and Development) countries (Cohen and Soto, 2007).

According to the Human Capital Theory, increases in personal stock of knowledge or human capital, increase the individuals productivity in the market sector of the economy, where he produces monetary gains, and "non-market" sector, where the individual produces goods entering in its utility function. In this line, the theory rests on two assumptions: 1st - The human capital is something produced, ie, something that is the product of deliberate investment decisions in education or training; 2nd - The individuals are holders of certain personal characteristics (some of them partly innate as intellectual skills, and others that are acquired throughout life, such as formal and informal education, training and experience), which contribute to increase their productivity. Thus, we can define the Human Capital as the set of skills and knowledge of individuals that together with other personal characteristics and effort, increases the possibilities of producing personal, social and economic well-being. This definition encompasses the level of schooling and training (level of formal and informal education), investments in health as well as the existence of a set of infrastructure for education, training and research.

Although there were already references to the health-capital as a component of the stock of human capital, Grossman was the first to build a model of demand solely for health with the justification that the health-capital doesn´t exert a direct relationship with the wages, but the difference compared to other elements of human capital is in the fact that the stock of health determines the total amount of time that the individual can use to produce gains of capital and goods.[10] Thus, the innovative elements introduced by Grossman which still linger today, were, first, treating health as a stock, analogous to the stock of human capital, secondly, to consider health as a joint production process requiring either the individuals contribution (particularly through the use of time), either the consumption of appropriate goods and services, called healthcare. In this line, the individual inherits an initial stock of health capital that depreciates over time, but can be increased with acts of investment, that can be all types of health-promoting behaviours (consumption of health care, healthy eating, etc.) or decreased through unhealthy behaviours, which leads the rate of depreciation to defer from person to person.

[10] Although Mushkin (1962) did not present a formal model of health behaviour, he was the first to describe health as an economic good, considering health a human capital stock yielding both investment and consumption benefits (Amaya M. I., 2000).

Thereby, the model advocates health as a consumption good (goes directly into individuals the preference function) and investment (Wagstaff, 1986).

It is necessary to take into consideration that one of the essential production factors is the time dedicated by the individual to the production of health. Healthcare constitutes also as a productive factor, since it is acquired with the purpose of producing health.[11] People produce health by combining market goods and services with time, consistent with Becker's model of household production (Becker, 1976).

Individuals allocate time and money to maximize the present discounted value of lifetime utility. Indirectly, length of life is a choice in the original model which contains no uncertainty, generating some criticism among some of the health economists' community (Cropper M.L., 1977). In fact, Grossman's model neglects the uncertainty by defining the depreciation rate deterministically, in which no stochastic shock can affect the health of the individual, and therefore each one exerts complete control over his own health (Cawley and Ruhm, 2011). In agreement with this, individuals just allocate time and money to maximize the present discounted value of lifetime utility.[12]

Brian Greene once said that "Exploring the unknown requires tolerating uncertainty". In economics particularly, health economic decision models are subject to considerable uncertainty which is rarely accounted formally (Jackson et al., 2009). In fact, few papers introduced uncertainty into the Grossman's model in spite of its importance. Although, for example, Dardanoni and Wagstaff (1987), Selden (1993), or Chang (1996) introduced uncertainty into the Grossman's model, their studies treated only one or two period model. Avoiding technical-modeling difficulties, Liljas (1998) was perhaps the first to assume that the health stock at each point in time is given as the

[11] However, we should not rule out the possibility that poor health status might be created by additional medical services. *Iatrogenesis* is an adverse condition induced in a patient through the effects of treatment by a health professional. It can arise in many ways: through clinical errors of diagnosis or treatment, through medical negligence, through environmental effects as in nosocomial infection, through the careless or deliberate flouting of best practice guidelines. To address these unsatisfactory situations many countries have conducted several reforms in iatrogenic death investigations during the last years (Leflar, 2009).

[12] The time of death results from conscious decisions regarding health investments made with full knowledge of their implications for longevity. However, at high ages, the depreciation rate of health capital may become so large that the individual is unable to afford sufficient flows to stay alive. The general biological deterioration is reflected by the significant increase of the incidence of various diseases at 65 and by the general deterioration of physical robustness during old age, which leads to a retrenchment of the of socioeconomic factors impact on health and mortality (Kiuila and Mieszkowski, 2007).

realization from a probability distribution, deviating from the fundamental notion of the demand for health model illness perception in which changes in health are realized through gross investments and depreciation. Consequently, by assuming that health-related uncertainty operates directly on the health stock[13], it was possible to avoid the difficulty that would be faced if Grossman's notion of uncertainty was followed instead (Bolin, 2011; Liljas, 1998; Tabata and Ohkusa, 2000).

The original demand-for-health model comprises two types of human capital: health (H) and educational (E), being health determined within the model (endogenous) whereas education stock is taken as given (exogenous).[14] The concept of utility (U) is also very important to fully understand the model, as it is essential to all economic theories which are built on individual choices.[15] Therefore, the utility function of an individual should be defined by Eq. (2. 1):

$$U = U\left(\phi_t H_t, Z_t\right) \quad t = 0, 1, \ldots, n \tag{2. 1}$$

H_t represents the stock of health in period t. ϕ_t corresponds to the service flow per unit of stock. In this sequence, $h_t = \phi_t H_t$ gives the total consumption of health services while Z_t is the consumption of other goods. H_0 corresponds to the stock of health in the initial period (value that is provided). The stock of health in the remaining periods, life extension and the planned date (n), are endogenous.

The isolated relation between an individual's stock of health and utility is captured in Figure 1, where the health capital, *H*, is measured on the horizontal axis and the level of utility, *U*, is represented on the vertical axis.[16] The positive gradient of the curve indicates that an increase in individual's stock of health directly enhances total utility. The shape of the curve is particularly important because it illustrates the

[13] Unescorted by taking the way through net investments.
[14] Educational capital has 2 important properties: it increases market productivity and consequently, it determines the individual's efficiency in combining time and goods in order to produce health investments.
[15] In consumer theory, the utility function represents the individual's preference order of each conceivable amount of the good. When there are two or more goods from which the individual derives utility, the utility function is assumed to provide a measure of the extent to which the individual is willing to substitute one good for the other (Bolin, 2011).
[16] For simplification, the intermediate step between the health stock, the services it provides, and the utility received from these services are ignored and it is assumed that the stock of health directly yields utility.

fundamental economic principle of the law of diminishing marginal utility.[17] An increase in health from H_0 to H_1 causes utility to increase from U_0 to U_1, while an equal increase in health from H_2 to H_3 generates a much smaller increase in utility, from U_2 to U_3, and even smaller (U_4 to U_5) from H_4 to H_5, which means that individuals value a marginal improvement in health more when they show a lower level of health.[18]

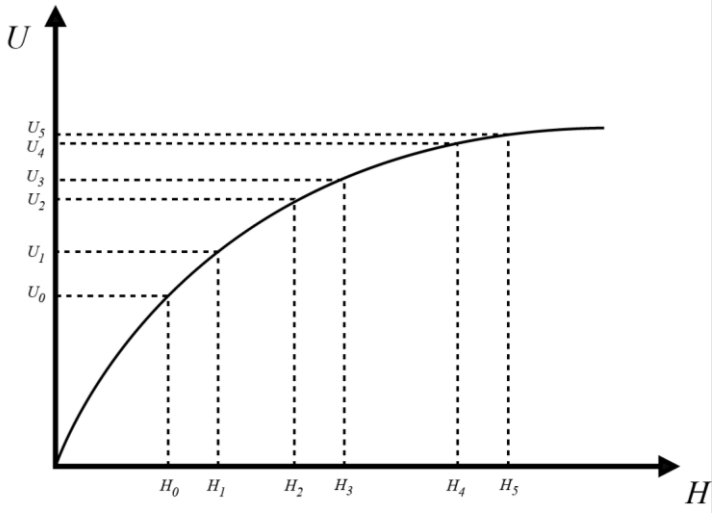

Figure 1 – Total Utility Curve for Health.

On that account, the cost function associated with the production of health investments may be (Eq. (2. 2):

$$C = C(w(E), \overline{p}; E) \cdot I = \pi(w(E), \overline{p}; E) \cdot I \qquad (2.\ 2)$$

Where *w* is the wage rate and $\overline{p}$ is the vector of prices of market goods used in health production, and π is the one-unit cost of producing I. Consumers produce gross investment in health and other goods in the utility function according to the Eq. (2. 3) and Eq. (2. 4):

$$I_t = I_t(M_t TH_t; E) \qquad (2.\ 3)$$

[17] Utility increases at a decreasing rate with respect to health which means that each successive incremental improvement in health generates smaller additions to total utility.

[18] It is possible that two or more subjects receive a different amount of utility from the same stock of health as the law of diminishing marginal utility only requires that the addition to total utility diminishes with successive rises in health for a given subject.

$$Z_t = Z_t(X_t T_t; E) \tag{2. 4}$$

It expresses the gross investment in health. M_t represents the goods purchased in the market that contribute to that investment. Similarly, X_t is the entry of goods that contribute to the production of Z_t. TH_t and T_t, correspond to inputs of time. E constitutes the stock of knowledge of the consumer. Therefore, as detailed in Eq. (2. 5), the net investment in the stock of health will be equal to the gross investment minus the depreciation:

$$H_{t+1} - H_t = I_t - \delta_t H_t \tag{2. 5}$$

δ_t corresponds to the depreciation rate (exogenous) over the t periods and depends on the age. In order to reduce the degree of complexity, we achieve the optimality condition regarding the demand for health capital in the Eq. (2. 6):[19]

$$\frac{e^{-(p-r)t}}{\lambda_0^w}\frac{\partial U}{\partial H} - w_t(E)\cdot\frac{\partial \tau_t^s}{\partial H_t} = \left(r + \delta_t^H - \frac{\pi_t(E)}{\pi_t(E)}\right)\cdot \pi_t^H\,(E) \tag{2. 6}$$

In the formulation above, λ_0^w is the marginal life-cycle utility of wealth at the outset (t=0). The left-hand side constitutes the MBHC (Marginal Benefits of Health Capital), which equals the discounted marginal consumption utility of health capital, and the monetary value of one additional unit of health capital. The right-hand side constitutes the marginal cost of an additional unit of health capital: the term *r* reflects the opportunity cost of investing in health rather than in the capital market; the depreciation term reflects the depreciation of each unit of health capital by a certain amount at each point in time; the last term reflects the variation over time of the one-unit cost of producing gross investments in health (Bolin, 2011).

The MBHC are demonstrated in Figure 2, which illustrates the individual's demand or marginal benefits (and costs) of health capital as given by Eq. (2. 6). The

[19] The condition was derived by, first, formulating the Hamiltonian function for the individual's optimization problem ($max \int_0^T e^{-pt}\, U(H_t, Z_t)dt$) and then applied the maximum principle (Bolin, 2011; Chiang, 2000).

downward sloping curve illustrates the MBHC, and the horizontal line corresponds to the MCHC (Marginal Cost of Health Capital), which is infinitely elastic since the marginal cost of health capital is independent of the stock.

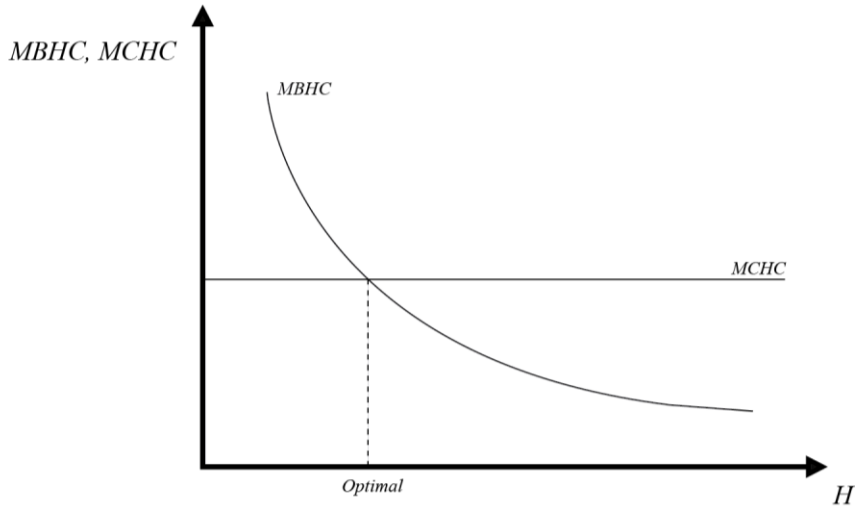

Figure 2 – Demand for Health Capital.

The most important predictions that can be derived from the demand-for-health model concern the individual's age, education and wage and the price of medical care. Basically, under normal conditions, age is positively correlated with expenditures on health care but negatively correlated with health capital, education is negatively correlated with expenditures on health care but positively correlated with health capital, the individual's wage rate is positively correlated both with the demand for health and with the demand for health care, and the price of medical care is negatively related with the use of medical care and health status (Sloan and Hsieh, 2012).

Detailing a bit those predictions, age decreases the demand for health implying a reduced demand for gross health investments, at the same time that the depreciation rate increases. Grossman (2000) has shown that the joint effect of these two forces led to an increase demand for gross health investments with age under plausible conditions. This suggests, for example, that the elderly demand more medical care than the young, as it is frequently noted to be the case (Folland et al., 2012).

Concerning the stock of educational capital, education improves household production efficiency and makes each unit of own time used in household production

more expensive (efficiency and time-price effects respectively) both increasing the demand for health. (Bolin, 2011) However, although the strong positive relation between education and good health, demonstrating a causal effect empirically has shown to be particularly difficult (Cawley and Ruhm, 2011).

Regarding the complex effect of wage on health, Deaton (2002) refers to it as the "income gradient" empathizing the gradual relationship between both. Anyway, in the demand for health, there are also two opposite effects: although income increases the value of available healthy time strengthening the incentives for being healthy, it makes more expensive the own time used for producing gross investments in health due to the increase of the marginal cost of health capital (Bolin, 2011). Once again Grossman (2000) showed an increase demand for health when combining those opposite forces, as long as the investments were not produced solely by own time. Nevertheless, according to Santerre and Neun (2013), the last years have been object of extensive research on this matter which led to classify the several hypotheses presented by, into four broad categories: the absolute income hypothesis, the relative income or deprivation hypothesis, the relative position hypothesis and the income inequality hypothesis.[20]

The political relevance of Grossman's model is increasing since it is the only model about individual behaviour in health that has strong foundations in economic theory. The model has been employed widely to explore a variety of phenomena related to health, inequality in health, medical care, the relationship between health and socioeconomic status, occupational choice, and many other subjects (Galama and Kapteyn, 2011).

Not always the empirical evidence have corroborated the testable implications of the theoretical predictions, which led to a significant criticism (Morris et al., 2007).

Besides the already mentioned simplistic deterministic nature[21], the model has also been criticised for allowing complete health repair (Case A., Deaton A., 2005), for not determining length of life and for its formulation in which medical investment in

[20] Detailed explanation of the different categories can be found in the paper published in 2004 by Lynch et al.: "Is Income Inequality a Determinant of Population Health? Part 1. A Systematic Review".
[21] Laporte and Furguson (2007) incorporated uncertainty in the health production model by applying stochastic dynamic optimization methods.

health has constant returns which is argued to lead to an unrealistic "bangbang" solution (Ehrlich and Chuma, 1990).

Zweifel et al. (2009) also argue that some of the implications of the Grossman's model are "not consistent with available empirical evidence", mainly because permanent health status and demand for medical services are negatively rather than positively related, and so, is not possibly to affirm that expenditure on medical services constitutes a demand derived from an underlying demand for health. In that same paper the authors suggest future possible research in the area of corrective action of individuals.[22]

Nevertheless, that criticism has led to theoretical and empirical extensions of the model, which to a large extent address the issues identified.[23] Those related empirical works were often inspired more by the intuition of Grossman's model than strict adherence to its theoretical features.

More recent studies have shown great support of the model, mostly because the information collected comes mainly from longitudinal studies with a variety of health outputs and inputs, instead of the past when the information focused mainly on cross-sectional studies. Furthermore, improvements in data extraction during the last decades made possiblbe the application of the model under different empirical approaches.

Laporte (2014) in his latest paper argues that the criticisms made by Galama et al. (2012), Galama and Kapteyn (2011) and Zweifel (2012, 2013) don't constitute a significant arraignment of the Grossman's model of investment in health theoretical structure, and that most of the criticisms made by other health economists "seem to come down to having looked at an intrinsically model through static eyes". Although emphasizing that there is still space for extensions of the model in various directions, Laporte affirms that before moving on to more complicated models, first it would be important to understand the depths of the dynamics present in the simple model. In fact, the dynamic characteristics of the model have not been fully applied in many relevant areas of health policy, which leaves open potential breakthroughs in health production

[22] The prediction is that the longer the string of healthy days, the lower will be the preventive effort (ceteris paribus).
[23] For an extensive review please check the work published by Michael Grossman in 2000 and the work referenced therein.

field. Grossman (2000) himself states the message that "a very different theoretical paradigm is required to understand the determinants of health outcomes".

As a final remark, it is necessary to take into account that as Sloan and Hsieh (2012) state, "models are judged by the accuracy of the predictions they offer rather than on how plausible the assumptions appear to be", and for example the assumption of rational behaviour in Grossman's Model may be valid in some contexts and not in others. Despite the limitations aforementioned, theoretical extensions and competing economic models are still relatively few (Galama et al., 2012). The explanation why Michael Grossman's Model has remained the same since its beginning with many economists emphasizing that it is as relevant today as it was 40 years ago is due to the fact that it still provides a logically consistent framework that explains observed differences in health, investments in health including medical care and consumption, and evaluates public and private policies to affect these outcomes (Kaestner, 2013). Nevertheless yet there are some improvements needed in order to refine the model. One of them definitely concerns the necessity to point out the important distinction between ex ante and ex post investments in health, which is not developed in the model (Zweifel, 2012), allowing for substitution possibilities between ex ante and ex post investments in health that likely occur. In line with this, suggestions for worthwhile future research go around the substitutability phenomena of an individual's own preventive effort by medical care.[24] Kaestner denotes that the furtherance of a "more productive way to move the health economics field forward" needs to integrate an health production function with that distinction (or related specifications), into the models of health and longevity developed by Murphy and Topel (2006) and Becker (2007), without highlight changes in consumer preferences.

[24] There is little empirical evidence on these relationships (Zweifel and Manning, 2000). On one hand more preventive effort in the healthy state leads to a longer expectation on the duration of the healthy state during which no health care services are required, but on the other more medical care restores good health quicker, resulting in a longer string of healthy days.

2.3 ESTIMATION METHODOLOGY

The importance of specifying health production functions is due to the necessity of allocating limited resources among alternative health inputs consequently producing the largest possible increase in health status (Wibowo and Tisdell, 1992). Production functions have been estimated for a wide variety of outcomes including for example self-rated health, mortality, obesity and weight gain (Vaidya, 2013).

Although Grossman's theoretical model was designed for analysis of health production at micro level the aim of this study is to analyse the production system at macro level. Consequently, in order not to lose the theoretical ground when switching from micro to macro analysis, the elements of the vector of individual inputs to the health production function (Eq. (2. **7**) are represented by per capita variables and regrouped into sub-sectoral vectors of economic, social, and environmental factors as:

$$H = F(E, S, En) \tag{2. 7}$$

where *E* is a vector of per capita economic variables, *S* is a vector of per capita social variables, and *En* is a vector of per capita environmental factors. In its scalar form de equation can be rewritten as Eq. (2. 8):

$$h = f(e_1, e_2, \dots\ e_a, s_1, s_2, \dots\ s_b, en_1, en_2, \dots\ en_c) \tag{2. 8}$$

where h is individual's health status proxied by the self-reported health status, $(e_1, e_2, \dots e_a) = E$; $(s_1, s_2, \dots s_b) = S$; $(en_1, en_2, \dots en_c) = En$, and a, b, and c are number of variables in each sub-group, respectively. Using calculus, can be transformed to its explicit form and given as Eq. (2. 9):

$$\mathrm{h} = \Omega \Pi \mathrm{e}_{\mathrm{g}}^{\alpha_{\mathrm{g}}} \Pi \mathrm{s}_{\mathrm{h}}^{\beta_{\mathrm{h}}} \Pi \mathrm{en}_{\mathrm{i}}^{\gamma_{\mathrm{i}}} \tag{2. 9}$$

where α_g, β_h, γ_i are elasticities and Ω estimates the initial stock of health.[25]

[25] Although being out of the scope of this work, discussions about various aspects of production functions, e.g. isoquant curve and the elasticity of production are important when addressing these issues.

In line with this (for elucidation purposes) if for example we take the logarithm of the previous equation, a loglinear Cobb-Douglas production function (Eq. (2. 10) of the study can be written as:

$$\text{Ln } h = \ln\Omega + \sum \alpha_g (ln\, e_g) + \sum \beta_h (ln\, s_h) + \sum \gamma_i (ln\, en_i) + \mu_j \qquad (2.\ 10)$$

where $g = 1, \ldots, n$; $h = 1, \ldots, n$; and $i = 1, \ldots, n$ and μ_j is the disturbance term.

Other example is Kenkel (1995) health estimation as a function of several lifestyle factors including smoking, drinking, eating breakfast and stress, with separate reduced form equations for each of five health outcomes that include both subjective and objective (self-reported) health measures, using an ordered probit model.

It is possible to find in the literature several possible health production functions forms, such as linear, quadratic, log-linear, reciprocal log-linear, loglinear Cobb-Douglas, double log, etc.

Anyway regardless of the method chosen, the identification of inputs and outputs and specification of the linkage between them provides the basis for estimating costs and benefits of those variables.

The specific methodology used in this thesis is explained in the chapter 0.

2.4 EMPIRICAL EVIDENCE ON THE PRODUCTION OF HEALTH IN USA AND EUROPE

According to the WHO 2009 report, "Global health risks: mortality and burden of disease attributable to selected major risks", socioeconomic factors, environmental and community conditions, and individual behaviour lead to a complex chain of events over time, arguing that the modification of these background by influencing multiple proximal causes is likely to have amplifying effects and so, the potential to yield fundamental and sustained improvements to health. In line with this, results of several epidemiological works led to a growing apprehension about the strong relationship between health and "life styles".[26]

Concerning empirical research, according to Jones and Rice (2005), health economics has been at the forefront of developing analytical tools able to measure and explain health production and inequalities. The equilibrium equation derived under the assumption of a linear health production process has been the basis for most of the empirical tests of the health production literature (e.g., Grossman, 1972b; Wagstaff, 1986).

Anyway, although the production of health has been the focus of numerous empirical studies which adopted a health production function analytical framework focusing the marginal contribution of selected economic, social, environmental, and medical inputs on various measures of health outcomes, until the XXI century only a few studies tried to estimate an aggregate, multifactor health production function for the USA (Thornton, 2002).

In fact, compared to other fields of empirical research in economics, there is low amount of works focused on testing the predictions of the demand-for-health model, mainly due to the fact that the empirical testing needs to employ longitudinal and suitable data that has not been available for many decades (Bolin, 2011).

Poças and Soukiazis (2010) claim that the numerous studies that concentrate their analysis on the determinants of health generally emphasize, beyond socio-

[26] As "life style", we are refering to all the factors over which individuals have power.

economic factors, the health care resources and lifestyles role, as well as some biomedical factors, the last ones in a microeconomic perspective. Nevertheless, the same authors argue that there is not much diversity concerning the methodology used in the economic literature of this topic and most of those studies follow the DEA (Data Development Analysis), a non-parametric method of estimation or the production function approach.

Since Grossman's Model publication, several authors have estimated reduced form models, which regardless using a large variety of methodologies and data from diverse institutional and cultural environments, are broadly in agreement with one another and in line with the predictions of the model (Galama et al., 2012).

Notwithstanding the fact that the decision making process at the health level often occurs within the family, previous formulations of the Grossman's Model only consider the individual in isolation.[27] In this sense, the model has been extended in order to take into account the fact that most people lead their lives within a family, and although the structure of a family may change over the lifecycle, the fact remains that other individuals with whom a person lives influence behaviour (Bolin et al., 2002). Approaching the empirical relationship between economic status and health in the family context is important as there are multiple interactions within a family (which can be usefully analysed in unitary, collective or institutional settings) that may significantly affect the relationship between economic status and health (Tipper, 2010).[28] The advantage of considering various approaches is that empirical analysis of family economic behaviour indicates the existence of substantial heterogeneity across families.[29] In fact, some economists have already suggested that no single economic

[27] Jus in the past decade Jacobson (2000) introduced the corresponding combined production possibility frontier, using a framework in which family members have common preferences. The most meaningful apprehension provided was that not only individual's income can be used in the production of health, but rather that the family's joint resources are important (Bolin et al., 2002; Jacobson, 2000).

[28] Although the health production function relates intra-household resource allocations to health, there are reasons to suspect that being part of a family confers benefits to health in addition to those working through the function, mainly because many factors might be unobservable and, therefore, unaccounted for in empirical analyses of the determinants of health which in part explains why the adoption of a particular framework might depend on the issues the empirical researcher wants to investigate (Tipper, 2010).

[29] For example, the income-pooling hypothesis implies that only total income needs to be considered and so, the effect of income on health does not depend on who provided the income or how it was earned. Contemporaneously, economists have questioned the existence of a unitary set of preferences for the household and have specified models allowing the individuals within the household to have different preferences over how to allocate the time and money available to them (Browning and Bonke, 2009).The

model of the household is applicable to all family situations (Munro et al., 2006), which leaves a great potential for further theoretical work and empirical refinements.

Generally speaking, empirical evidence shows that health crops up to increase with income, education and sports activity and decrease with age, the price of medical care (treatments, procedures, and devices that may be used to prevent, diagnose, and treat health problems), physically and mentally demanding work environments, manual labor, psychological stress, overweight, smoking and heavy alcohol consumption.[30] Females have worse health than males, and singles have worse health than married individuals (Galama et al., 2012).

More recent empirical investigations have been trying to find unobserved variables that might affect health status and explain the impact of interwoven causes in the health production function. As example, Balia and Jones (2008) in their paper "Mortality, lifestyle and socio-economic status", estimated the determinants of health status by relating premature mortality to a set of observable and unobservable factors, focusing on unobservable individual heterogeneity.

Many variables have shown to have a powerful association with health status, but proving its causality has been issue of disagreement between many dedicated health economists.

Baltagi et al. (2012), studied the spatio-temporal variations in health productivity in the OECD countries, over the last three decades, by estimating a production function where life expectancy depends on health and social spending, lifestyle, and medical innovation. Although their results must be interpreted with care (due to the complexity of the phenomenon, data limitations and limited set of variables) they found that health spending does have a significant but mild effect on health outcomes, even after controlling for medical innovation.

As we already mentioned in the subchapter 2.2, the relationship between health and educational capital is particularly important since this two human capital

widespread rejection of income pooling in the empirical literature has been influential in weakening the case for the unitary model evidence therefore suggesting that the source of income is likely to be important for health status. (Lundberg and Pollak, 2008; Rode, 2011).

[30] Moderate alcohol consumption evidences either positive or almost negligible associations with health.

components are the most important target for public policy initiatives in the area of individual welfare, and in line with this, a major focus of discussion is education, particularly schooling. Even Albert Einstein himself once said that "The only thing that interferes with my learning is my education." Grossman (2000) claims that empirical literature "underscores the potential payoffs" of interactions between schooling and health, by improving health by enhancing allocative or productive efficiency. There is a positive strong correlation between the number of years of formal schooling completed and good health, independently of the chosen indicator of health[31] or unit of observation[32] (Bolin, 2011). Many empirical works reinforce this conclusion[33], some of them even distinguishing direct from indirect effects on health such as Häkkinen et al. (2006) who estimated in their analysis a productive and an allocative effect of education respectively. Even though, not all the evidence goes in that direction. Analytical solutions for the Grossman's model are usually based on two sub-models: the pure investment model (health does not provide utility) and the pure consumption model (health does not provide a production benefit). In his work, Galama (2012) argues that besides in the pure investment model, higher education leads to a higher demand for medical goods and services, in the pure consumption model, the sign is ambiguous and depends on the relative efficiency gains from education for consumption and health investment. This contrasts with the usual prediction of the Grossman's model that education unambiguously reduces this demand.

As already mentioned in this chapter, it would be expected too a positive relation between health care resources and health status if increasing resources implies an improvement in the level and/or quality of health services supplied to the population, but the empirical evidence that emerges from the studies that have been carried out so far in this area is rather weak and conflicting. In fact, many regional studies carried out within different countries do not lead to a consensus. For example, in several studies examining cross-regional differences of mortality and morbidity in the U.S.A, the impact of health care is usually shown to be slight or even negative (Bolin, 2011; Or, 2000). One reason for these conflicting results might be related with the difficulty in

[31] Either physiological indicators or self-assessed health, morbidity or mortality rates.
[32] Individuals or groups.
[33] Several empirical confirmations can be found consulting for example the works of Lleras-Muney (2005), Oreopoulus (2006) and Cutler and Lleras-Muney (2010).

measuring health care inputs and the partial nature of many of the available indicators of health resources. Other reason may be related with the fact that most studies ignore the distribution of health care in the country, a factor that might be as important for health outcomes as the overall level of expenditure/consumption of health services. All this brings the conclusion that although on average increased health care spending is likely valuable, at the margin higher spending is not (Chernew and Newhouse, 2011; Or, 2000). For decades, high health care spending growth has been a feature of health care systems in all developed countries. In fact, technology has been identified as a primary driver of long-run spending growth, and so, it is reasonable to expect clinical benefits associated with higher spending, as empirical evidence supports indeed (Bundorf et al. 2009). Just for elucidation purposes, we present in Figure 3, the TPC (Total Product Curve) which pivots and rotates upward (from TPC_0 to TPC_1) with the development and application of new medical technology because of an increase in the marginal product of medical care (MC), with each unit of medical care consumed now generating an higher amount of health. A movement from point A to point B illustrates the case in which a new technology results in a simultaneous increase in the amount of medical care consumed (MC_0 to MC_1) and improvement in health (H_0 to H_1). A movement from point A to point C depicts the case in which the new medical technology has no impact on health but results in less consumption of medical care (MC_0 to MC_2).

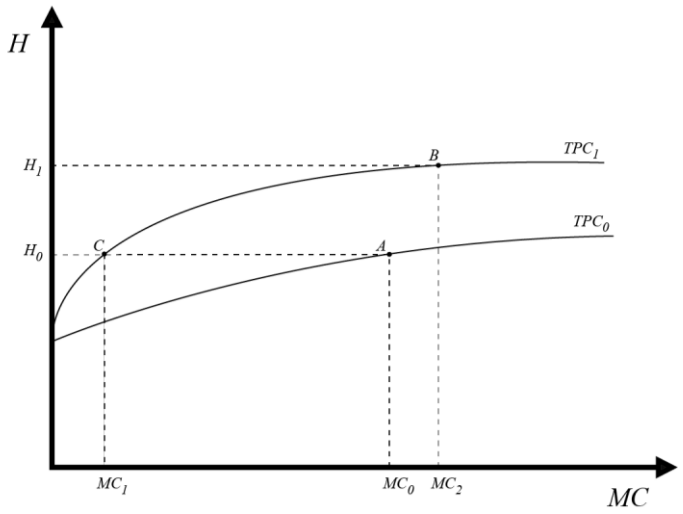

Figure 3 – Effect of Technological Change on Total Product Curve for Medical Care.

Kohn and Patrick (2008) generalized models of medical care demand and explained that the higher demand among the old and sick individuals comes from the fact that health declines to regain equilibrium with a declining cost of health capital. Their model also suggested that, over time, the advancement of medical technology increases the demand for medical care (while the influence of price on demand decreases), emphasizing that empirical specifications should allow for intertemporal substitution, and relax the assumption of separability between the demands for medical care and other consumption.

However, despite spending growth is not uniform across diseases with evidence suggesting that the majority of spending at a point in time is concentrated among beneficiaries with poor health status[34], the relationship between disease burden and spending growth is not concentrated among the illest (Chernew and Newhouse, 2011). Subsequently it appears reasonable *a priori*, to assume as mentioned, a positive relation between income level and health, but once again, empirical studies over the past decades have given contradictory results on this relationship (Or, 2000).

It is important to have in consideration that the link between Grossman's Model theory and empirical research is many times overlooked, and so, the consideration of the underlying theory shall always be crucial to the fully understanding of empirical outcomes. Future empirical investigations will surely profit from both new data collection methods and more appropriate use of existing data.[35] For instance, biomarkers are becoming more available in data used by health economists. Also, the ability to collect biospecimens along with social survey data opens up a wide range of exploring opportunities, allowing the estimation of the distribution of a particular genetic variant within a representative sample of the general population and correlating genetic variations with differences in phenotypes, as well as using the biodata derived from biospecimens to verify certain responses to survey questions.[36]

[34] Especially those requiring hospital inpatient services, having multiple chronic conditions or who are in the last year of life.

[35] Most profound applications might result from combining genetic or other biological data with data on social and environmental factors (Hauser et al., 2010).

[36] Although being used many times interchangeably the terms "biospecimens", "biomarkers" and "biodata" have different meanings. Biospecimens refers to the actual biological material that is collected from a study participant. A biomarker (often derived from a biospecimen), is a measurable factor that is

The way individuals consider their health status (self-reported health) has been being increasingly valued both in economical and medical research as well as in clinical decision making, leading to several revisions of the instruments able to measure health status and HRQL[37] during the recent years (Ferreira and Ferreira, 2006). Additional empirical testing will then be required to determine whether the previously mentioned predictions do in fact hold for the self-reported health production function results to be explained.

associated with a particular medical condition. Biodata refers to the digital data derived from biospecimens (Hauser et al., 2010; Poste, 2012).

[37] HRQL is a multi-dimensional notion that incorporates domains related to physical, mental, emotional and social functioning, which focuses on the impact health status has on quality of life, going beyond direct measures of population health, life expectancy and causes of death. A related concept is well-being, which assesses positive emotions, life satisfaction and other positive aspects of an individual's life (Healthy People 2020, 2010).

2.5 PORTUGUESE SCENARIO

According to Barros, Machado and Simões (2011) improvements in Portuguese population health status that occurred in the last decades are associated with a general improvement in socioeconomic conditions combined with increases in human, material and financial resources devoted to health care, mainly due to economic growth and continued political commitment.

Anyway, notwithstanding similarities between Portugal and other developed countries, evidence on the health determinants can be context dependent. If we are analysing mechanical, physical or biochemical processes that occur at the level of human physiology the acceptance of foreign studies results may be legitimate. However, when we intend to analyse the individual decision taken on behaviours likely to affect the health status, the validity of the direct importation of results from international studies to the Portuguese population is highly questionable. We have to take into account that different cultural and historical paths of populations, different political and economic situations of the countries, strength of civil society, different health systems, different doctor-patient relationships, different relationships between the individuals and the disease may have huge influence (CSDH, 2008; Vintém, 2008).

Even though there is a rich literature that looks at the relation between the various explanatory variables and health status for many countries and regional economies of Western Europe and North America, there is a dearth of theoretical and empirical research that analyses the impact of the economic, social, and environmental factors on the health status of Portugal using recent data. Most of the health data collected in Portugal is not prepared to be integrated in a GIS (Geographic Information System) which is a system designed to capture, store, manipulate, analyse, manage, and present all types of geographical data, in this case, health data (Santana, 2005). The particularities that reflect potential specificities of the situation in Portugal require a better understanding of health and the demand for health by the Portuguese people, making it essential to recognize the real impact of decisions on lifestyle in health status, in order to identify effects and their magnitude (Barros, 2003).

The INS (National Health Survey – "Inquérito Nacional de Saúde") is a measuring and observation instrument in health, which collects Portuguese population-based data, generates estimates of some states of health and disease and their determinants, and examines their evolution over time. The INS was planned and tested for the first time between 1980 and 1982. After regional surveys, conducted between 1983 and 1985, the first INS was held in 1987, covering the Portuguese mainland. Be noted that the USA NCHS (National Center for Health Statistics) participated in all phases of work, including the final evaluation (Ferreira and Lemos, 1987). Until now, according to INSA & INE (2009), just four INS have been performed (1987, 1995/1996, 1998/1999 and 2005/2006) using representative probability samples of the population from Portuguese mainland (1st, 2nd and 3rd INS) and also from autonomous regions of Açores and Madeira (4th INS). At the moment it is in process the fifth INS.[38]

In recent years the INE (National Institute of Statistics) has provided information, published annually, on all areas of health, "replacing" at level of production and dissemination of information, the now defunct DEPS (Department of Studies and Planning in Health) of Ministry of Health. These indicators have been relevant for defining public health policies and for promoting new strategies consequently altering the impact of risk factors on the population's health. Nevertheless, despite the improvement of quality and access to information, there are only still very few studies that aim to aggregate information (health and other) and construct models able to measure the impact of economic, social and environmental determinants in health outcomes (Santana, 2005).

The concept of health citizenship is not particularly widespread in Portugal mainly because the state tends to be regarded as responsible for population health status

[38] INSA (National Institute of Health Dr. Ricardo Jorge - "Instituto Nacional de Saúde Dr. Ricardo Jorge"), signed with ACSS (Administração Central do Sistema de Saúde), the Program Operator of Initiatives in Public Health, funded by the Financial Mechanism of the European Economic Area 2009-2014, the contract of Pre-Defined Project for the development of the first National Health Survey with Physical Examination - INSEF 2013-2017, which will be ratified by the FMO (Financial Mechanism Office). The purpose of INSEF 2013-2017 is to improve public health and reduce health inequalities in the population living in Portugal, through the provision and communication of epidemiological information of high quality about health status, health determinants and healthcare use. This population-based survey will have an interview component associated with the collection of objective anthropometric data and blood collection, and will be applied to a representative sample of the Portuguese population in terms of region, encompassing the mainland and the autonomous regions. The project, takes place between 2013 and 2017, is coordinated by the Epidemiology Department of INSA, and will have as partners the Department of Epidemiology of the Norwegian Institute of Public Health (INSA, 2013).

and in that sense reduces responsibility in relation to patients' choice (Barros et al., 2011). Nevertheless, concerning health production and maintenance, evidence shows that Portuguese population is becoming more active, reflected in increased compliance with preventive actions (Cabral and Silva, 2009). For upcoming years, in order to leverage a better access to quality health care, freedom of choice mechanisms will be developed as recommended by the LBS (Basic Law on Health - "Lei de Bases da Saúde").[39] Public engagement forms the cornerstone of all aspects of public health work.

The importance of analyzing the perception that people have of their health has been highlighted in research because it allows a better understanding of individuals' real needs. Although health status and self-rated health tend to decline with aging, many older Portuguese people consider their state of health satisfactory and have a tendency to underestimate its decline, as demonstrated by the two components ''autonomy'' and ''perception of health and emotional status'' in the EPEPP (''Profile of the Aging of the Portuguese Population, "Estudo do Perfil de Envelhecimento da População Portuguesa") study.[40] In what concerns gender and in contrast to what has been reported by other authors for several health indicators and health-related behaviour, it was found that older women experience a good mobility and health self-evaluation similar to men of the same age (Rodrigues et al., 2014).

Figueiredo and Cardoso (2014), in their cross-sectional analytical observational study (of a population aged ≥ 35 in the County of Coimbra), found that the personal characteristic with the greatest impact on the HRQL, a generic indicator of the state of health, was the biological factor, gender. The paper also highlighted age as an important marker in understanding population's health, with HRQL deteriorating as age increases. The perception of HRQL was also influenced by the conjugal situation (health indices were better in those who were single and those who were married/in a stable

[39] SNS (National Health Service - Serviço Nacional de Saúde") has maintained a mitigated model of freedom of choice, and that's why, since September 2011 there has been an effort to increase the availability of continuous information allowing citizens and communities a greater understanding of the performance of the SNS, consequently reinforcing the mechanisms of transparency and accountability in the management, provision and use of health care (MdS, 2014).

[40] This was a community-based observational study from a representative sample of the Portuguese population (subjects older than 54 years), whose aim was to characterize the socio-demographic components of the elderly population disclosing factors that could have influence in the aging process and in the elderly quality of life (Mota-Pinto et al., 2011).

relationship than those who were widowed), socioeconomic conditions, work status (lower levels of HRQL were found in those who were inactive, and a similar pattern was found in those whose employment was precarious), chronic diseases (its frequency suggests a negative impact on HRQL) and several other behaviour factors such as sedentary, smoking and alcoholic drinking.

It is also important to address immigrants' health, as United Nations (2009), estimates that the immigrant population represents 8.6 % of the total population in Portugal.[41] Many research on migration aimed at assessing health status uses self-reported health as a proxy measure to health (Idler and Benyamini, 1997). This group of the population has many particularities, one of them has to do with the fact that they perceive their general health diversely according to their background (Benisovich and King, 2003). In the particular case of Portugal, evidence shows that health status differs across origin as well as length of stay, with recent immigrants referring to have good health more oftenly.[42] On the opposite side, immigrants with a longer length of stay mentioned using health services more frequently, supporting the notion that the more the time spent in Portugal, the more is the immigrants' awareness of health rights and knowledge on services available. Anyway, despite the continuing interest in understanding health differentials among immigrants, gaps in knowledge still remain (Dias et al., 2013).

The rise in the employment share of white-collar workers, in most of the OECD countries, had great importance in the reduction of premature mortality between 1970 and 1992. In Portugal the improvement in health due to the rise in "work status" was more than double the contribution from the rise in per capita income.[43] In line with this, while it is well established that there are considerable health inequalities across social-economic classes, the reasons for these differences are less well identified (Barros et al., 2011; Or, 2000).

One of the most important health problematics comes from the fact that although in Portugal there still is a traditional reliance on the family as the first line of social care

[41] The main regions of origin are Brazil, Portuguese speaking African countries, and Eastern European countries.
[42] Pattern attributable to the healthy immigrant effect.
[43] The economic growth over this period was much faster than the OECD average.

(particularly in rural areas), due to demographic, epidemiologic and cultural changes, many people can no longer rely on such informal care and the demand for health and consequently medical care is escalating (Santana et al., 2014), making it even more important to understand which variables have most influence in the Portuguese health production function.

New studies will be fundamental for defining the Portuguese population health profile in the present and predict how this profile may be used to explain the determinants for the future.

3. METHODOLOGY

3.1 RESEARCH QUESTION

This thesis ought to answer the following questions:

- What is the health perception of the Portuguese population?
- Concerning the heath production function for Portuguese Population, which variables influence it and in what direction?
- Are Portuguese individuals' health determinants in line with internacional empirical evidence?

3.2 VARIABLES AND THE DATA

Following the fundamental impulse that the study of Grossman (1972) represented in the evaluation of the concept of health capital, over the years, many other works have emerged allowing broaden his pioneering approach, making it the more comprehensive, complete and realistic. In fact, the importance of Grossman's contribution, particularly the concept that was behind his model led to the emergence of several new extentions of the initial analysis, from which we highlight the inclusion of working conditions, the family factor, consumption behaviours, among other elements.

In order to follow Grossman's work as well as other predictions, the analysis is based on the data collected from the EPIPorto project. EPIPorto is a population-based study in progress for about 15 years, with the aim of assessing the determinants of health in the adult population, consisting in a cohort of adults living in Porto, a large urban center in the north-west of Portugal. For this purpose, between the years 1999 and 2003, 2485 individuals were selected and have been repeatedly evaluated over time. The selection was made by random digit dialling of landline telephones having households as the sampling unit.[44] When a household was selected, all residents were identified by age and gender, and one resident (aged 18 or more years) was simply randomly selected as the respondent, without replacement within the same household if there was a refusal of that person. Inclusion criteria were adults, with Portuguese nationality, non-institutionalized and resident in Porto. Participants were invited to come to the Department of Clinical Epidemiology, Predictive Medicine and Public Health of the University of Porto Medical School, in order to answer a structured questionnaire on social, demographic and behavioural characteristics, and being target of a physical examination too.[45] All the process was conducted by trained interviewers. During the follow-up evaluation of the cohort, toking place from 2005 to 2008, 1682

[44] The vast majority of houses (97 %) had a landline telephone at the time of this procedure. A table of random numbers was used to define the last four digits that are specific to individual houses, assuming the local prefix codes to limit the universe to the city of Porto. Non-existing numbers, those corresponding to fax numbers or telephone numbers of non-individual subscribers were ignored. The household was considered unreachable after at least four dialling attempts at different hours and including week and weekend days. The proportion of participation was 70 % (Ramos et al., 2004).

[45] In accordance with the Helsinki Declaration, all participants have given written informed consent to participate in the study. The study protocol was approved by the local ethics committee of Hospital São João, a university hospital.

individuals were scheduled for a follow-up visit to the Department, for questionnaire and physical evaluation, following the same protocol for data collection as at baseline.[46] Excluding participants who died between evaluations, the comparison between respondents and non-respondents found no significant differences regarding median age and gender at baseline (p=0.183 and p=0.406, respectively), and although respondents were educated to a higher level than non-respondents, this difference was not significant (p=0.053) (Lucas et al., 2009).

Health is the most important variable in this study, and thus is crucial to measure health as accurately as possible.

Although much literature about the health production function estimation suggests the use of either life expectancy at birth either mortality rates as indicators of health output, the health variable most often used in empirical studies is self-reported general health, which is administered in almost all surveys (Galama et al., 2012). It is a categorical variable, in which respondents assess their health using five categories: (1) excellent; (2) very good; (3) good; (4) fair; and (5) poor. Despite the fact that this categorical variable evidences a high predictive power for mortality and later-life outcomes (Idler and Benyamini, 1997)[47], consequently being a reasonably good measure of general health as judged by its correlations with other health variables, for the purposes of this study it was intended that health should be assessed as a continuous variable. In line with this, for this paper intent the dependent variable used will be GHP (General Health Perceptions) derived from the SF-36 (36-Item Short Form Health Survey). The SF-36, which has been constructed to survey health status in the MOS (Medical Outcomes Study)[48], is a multi-purpose, short-form health survey with 36

[46] Between 2005 and 2008, 1778 participants were contacted according to the initial inclusion order. The median follow-up was 5 years. The number of 1511 individuals comes from the 261 losses to follow-up (189 refusals and 72 deaths).

[47] Global self-rating of health has shown to be a better predictor of 7-year survival than medical records or self-reports of medical conditions in participants of the Manitoba Longitudinal Study in Mossey and Shapiro investigation more than 3 decades ago. Until today, many population-based longitudinal studies have confirmed that global self-rated health remains an independent predictor of mortality, after adjusting for other factors known to predict mortality (Wang et al., 2006).

[48] SF-36 derives from the work of the Rand Corporation of Santa Monica during the 1970s, which compared the impact of alternative health insurance systems on health status and utilization. The outcome measures developed for the study have been extensively used and were subsequently refined and used in Rand's MOS, which focused more narrowly on care for chronic medical and psychiatric conditions (McDowell, 2006; Ware et al., 2002;). In fact, MOS was a two-year study of patients with chronic conditions, which was designed to determine whether variations in patient outcomes were explained by

questions, designed for health policy evaluations, clinical practice and research, and general population surveys, yielding an 8-scale profile of functional health and well-being scores as well as psychometrically-based health summary measures and a preference-based health utility index (Ware et al., 2000). The survey was constructed both for self-administration by individuals with 14 years of age and older, and for administration by a trained interviewer by telephone or in person[49]. The questionnaire has proven effective in surveys of specific and general populations when comparing the relative burden of diseases, as well as in differentiating the health benefits produced by a wide range of different treatments (Botturi and Rodella, 2014; Ul-Haq et al., 2013; Ware and Sherbourne, 1992; Ware, 2004). The translation and cultural adaptation of SF-36 scale, the validation of the sub-dimensions of the Portuguese version and the reliability and validity of theoretical concepts (construct validity) of the general dimensions, have already been published (Ciconelli et al., 1999; Ferreira, 2000; Severo et al., 2006).

It must be noted that SF-36 includes questions on feeling states since perceived well-being is subjective and cannot be completely inferred from behaviour. The queries on overall evaluation of health provide a summary indicator and apprehend the impact of health problems not directly incorporated in the other questions (McDowell I., 2006; Ware et al., 1993). It appears that the SF-36 will continue to be the leading general health measure for many years to come.

For the calculation of GHP, five items are used, particularly the answers to questions 1, 11-a, 11-b, 11-c and 11-d. The codes shown in the Figure 4 are replaced for those items, so that each of the item scores is oriented with higher scores representing better health (*x* represents the identity transformation).

differences in system of care, clinician specialty, and clinicians' technical and interpersonal styles, as well as to develop more practical tools for the routine monitoring of patient outcomes in medical practice. The 116-item MOS core survey measures of quality of life included physical, mental and general health. The questionnaire has been later divided into the SF-36 and SF-12 questionnaires (Hayes et al.,1995; McDowell, 2006).

[49] The questions commonly take 5 to 10 minutes to complete although elderly respondents may require about 15 minutes. Patients with visual or upper extremity impairments may need to have the SF-36 administered as an interview, with interviewers trained in basic interviewing skills and in the use of this instrument (McDowell, 2006; McHorney, 1996).

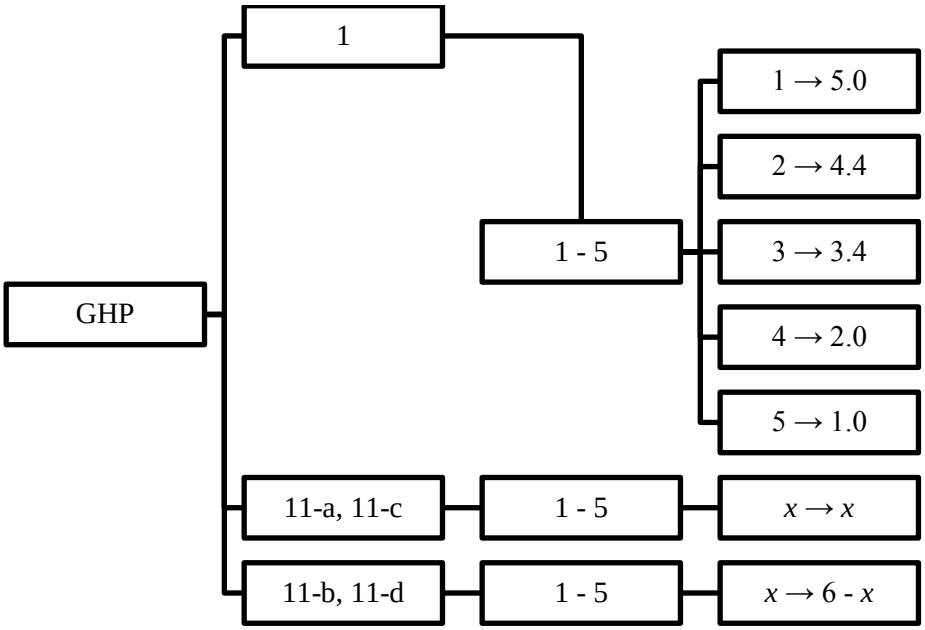

Figure 4 – GHP Scoring System.

Values for items 1 are recoded, using weights derived from Likert analyses (excellent is scored 5.0, very good = 4.4, good = 3.4, fair = 2.0, and poor = 1.0). For ease of interpretation, in order to assess the GHP for each individual, the approach consisted on calculating a score which could range from 0 to 100, using a transformation formula.[50] This transformation converts the lowest and highest possible scores to 0 and 100 respectively, and the scores between these values represent the percentage of the total possible score achieved. The formula (Eq. (3. 1) is the following:

$$Transformed\ Scale = \frac{(Actual\ Score\ -\ Lowest\ Possible\ Score)}{Possible\ Raw\ Score\ Range} \times 100 \qquad (3.\ 1)$$

With the active debate over the choice between health indexes and health profiles, SF-36 GHP 0-100 score has proven to be very sensible and precise on the prediction of individuals' health status, and so we intend it to be the best option as the proxy for health in this work.

[50] A value was obtained from the simple algebraic sum of responses for all items in that scale. Out-of-range values were checked and all item scores were orient so that high scores could correspond to better health and well-being. The simple summated scoring method is possible because all items in the same scale have roughly equivalent relationships to the underlying health concept and so, it is not necessary to standardize or weight the items. Missing value was given if over half of the items were missing. When fewer items were missing, they were replaced by that respondent's mean scores on the remaining items in the GHP scale.

As independent variables we use a host of variables hypothesized to affect the demand for health. Those explanatory variables were selected based on literature review in this area and can be categorized in three subgroups:

- Biological factors: age, gender, race, BMI (Body Mass Index).

- Socioeconomic factors: marital status, education, occupation, working hours, housework, alcohol consumption, cigarette consumption, physical activity (at work and total), sleeping;

- Medical Care factors: diseases needing medical care, medical facilities.

Age was recorded as the number of complete years (age at last birthday).

Gender was coded as male or female.

Race was coded as Caucasian or not.

For the calculation of BMI, body weight was measured to the nearest 0.1 kg using a digital scale, and height was measured to the nearest centimetre in the standing position using a wall stadiometer. Those anthropometric measurements were obtained after a 12 hours overnight fast, with the participant wearing light clothing and no footwear. BMI was calculated as weight (kg) divided by height squared (m^2) and individuals were categorized according to WHO recommendations in the following categories: obese ($\geq$30 kg/m^2), overweight (25.0–29.9 kg/m^2), normal (18.5–24.9 kg/m^2) and underweight (<18.5 kg/m^2) (National Institutes of Health, 1998).

Marital status was grouped in four categories: single, divorced/separated, widowed and married/living together.

Education was recorded as completed years of schooling.

Participants currently engaged in a remunerated occupation were classified as active, and the remaining as retired, unemployed or housewives. For those considered active, professional social status was defined according to their current occupation and the Registrar General five social classes.[51] In order to better access the quotidian life it

[51] The Registrar-General's Social Classes were introduced in 1913 and were renamed in 1990 as Social Class based on Occupation: (I) professional occupations, (II) managerial and technical occupations, (III)

was also asked to the individuals how many hours they work, what kind of physical activity they face in their job [52] and if they do housework or not.

Concerning alcohol, individuals were asked if they were drinkers or used to drink. Then, in order to assess the total alcohol consumption, participants were incited to discriminate the mean frequency of consumption of different types of alcoholic beverages during the last 12 months. The average portion consumed was asked to be higher than, equal to or lower than a glass of 125 mL for wine, a bottle or can of 330 mL for beer, and a cup of 40 mL for spirits.[53] After calculating the daily quantity of alcohol intake (grams (g)/day), the result was adjusted for seasonal variation of consumption (0.25 as assumed for a 3-months intake over 1 year).

Concerning cigarette smoking habits participants were classified as never-smokers (never smoked in life) and ex-smokers/smokers. For this last category, average daily cigarette consumption was recorded for each individual (it was used, according to WHO (1997), the period with longest exposition for this particular calculation).[54]

Total physical activity energy expenditure was ascertained by exploring all professional, domestic and leisure time activities over the previous 12 months. Participants reported their daily or weekly participation in each activity, as well as the average time spent in each of them and were divided according to the distribution of total physical activity, quantified in METs per hour.[55]

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skilled occupations (IIIa or IIIb depending if the occupation is non-manual or manual respectively), (IV) partly-skilled occupations and (V) unskilled occupations.

[52] Participants had to fit one of the following 4 categories: Sitting, Standing and walking, Standing and walking, but also climbs stairs or Heavy physical labour.

[53] It was considered the period of highest exposure, which fitted in one of the following nine categories: (1) never or less than once a month; (2) 1–3 times/month; (3) once a week; (4) 2–4 times/week; (5) 5–6 times/week; (6) once a day; (7) 2–3 times/day; (8) 4–5 times/day; (9) 6 or more times/day. The alcoholic beverages consumption was converted into total alcohol intake assuming the following alcohol concentrations in volume: 4.7 % for beer, 12 % for wine, 25 % for liquors and similar beverages, including Port wine, and 50 % for vodka and the like. This conversion was carried out using the software Food Processor Plus® (ESHA Research, Salem-Oregon), adapted to Portuguese drinks (Dias et al., 2011).

[54] Although the use of other types of tobacco besides cigarette was also questioned, due to their almost nil contribution only cigarette smoking was considered.

[55] The group of activities included rest (sleeping or sitting/lying awake), transport to or from work (walking, motorized vehicle, or other); professional activity (very light, light, moderate and heavy), household activities (very light, light and moderate) and leisure-time activities, which included very light activities (watching TV, playing cards, reading) as well as exercise (light, moderate and heavy). Each group was assigned a MET (Metabolic Equivalent) value. One MET corresponded to a resting oxygen consumption of 3.5 ml/kg/min. An average of 1.5, 2.5, 5.0 and 7.0 METs was attributed to very light, light, moderate and heavy activities, respectively. Energy expenditure was estimated by multiplying the

Sleeping hours were recorded as average number of hours dedicated to sleep per 24 hours.

To access medical care factors individuals were asked if they were currently suffering from an illness requiring regular medical care. Participants were also questioned what kind of medical facility they usually attended: Primary Care Centres, Physician's Private Offices, Hospital or Other Facilities.

Concerning the neighborhood socioeconomic assessment the characterization of neighborhoods in Porto was based on aggregated data at the census block level provided by the 2001 National Census. Using latent class analysis models, three discrete classes of neighborhoods were identified being 1 and 3 the least and the most deprived, respectively[56] (Alves et al., 2013). However as it was only available information from the first evaluation (baseline), the variable was not included in this model.

On Table 1, it is possible to check the summary of the variables used in the health production function.

Table 1 – Summary description of the predictors

Factors		Predictors	1st Eval	2nd Eval	Dif. Eval
Biological	Age	Number of complete years	$A_{1\alpha}$	$A_{1\gamma}$	$A_{1\delta}$
	Gender	Female	$B_{0\alpha}$	$B_{0\gamma}$	$B_{0\delta}$
		Male	$B_{1\alpha}$	$B_{1\gamma}$	B_{δ}
	BMI	Underweight	$C_{0\alpha}$	$C_{0\gamma}$	$C_{0\delta}$
		Normal	$C_{1\alpha}$	$C_{1\gamma}$	$C_{1\delta}$
		Overweight	$C_{2\alpha}$	$C_{2\gamma}$	$C_{2\delta}$
		Obese	$C_{3\alpha}$	$C_{3\gamma}$	$C_{3\delta}$
Socioeconomic	Marital status	Divorced/separated	$D_{0\alpha}$	$D_{0\gamma}$	$D_{0\delta}$
		Single	$D_{1\alpha}$	$D_{1\gamma}$	$D_{1\delta}$
		Married/living together	$D_{2\alpha}$	$D_{2\gamma}$	$D_{2\delta}$
		Widowed	$D_{3\alpha}$	$D_{3\gamma}$	$D_{3\delta}$
	Education	Completed years of schooling	$E_{1\alpha}$	$E_{1\gamma}$	$E_{1\delta}$
	Occupation	No occupation	$F_{0\alpha}$	$F_{0\gamma}$	$F_{0\delta}$
		Professional occupations	$F_{1\alpha}$	$F_{1\gamma}$	$F_{1\delta}$
		Managerial and technical	$F_{2\alpha}$	$F_{2\gamma}$	$F_{2\delta}$

related MET value by the self-reported duration of each activity, converted to minutes per day (Camões et al., 2010).

[56] Georeferencing was possible using the streets network (self-reported address was used to place individuals in a specific neighborhood), with information on initial and final numbering for each street segment. A total of 1662 neighborhoods were considered and the number of classes was defined according to the Bayesian and Akaike information criterion, interpretability and entropy.

		occupations			
		Skilled non-manual occupation	$F_{3\alpha}$	$F_{3\gamma}$	$F_{3\delta}$
		Skilled manual occupation	$F_{4\alpha}$	$F_{4\gamma}$	$F_{4\delta}$
		Partly-skilled occupations	$F_{5\alpha}$	$F_{5\gamma}$	$F_{5\delta}$
		Unskilled occupations	$F_{6\alpha}$	$F_{6\gamma}$	$F_{6\delta}$
	Working hours	Weekly Working Hours	$G_{1\alpha}$	$G_{1\gamma}$	$G_{1\delta}$
	Housework	No	$H_{0\alpha}$	$H_{0\gamma}$	$H_{0\delta}$
		Yes	$H_{1\alpha}$	$H_{1\gamma}$	$H_{1\delta}$
	Alcohol consumption	No	$I_{0\alpha}$	$I_{0\gamma}$	$I_{0\delta}$
		Yes	$I_{1\alpha}$	$I_{1\gamma}$	$I_{1\delta}$
	Alcohol Intake Amount	Alcohol Intake (g/day)	$J_{1\alpha}$	$J_{1\gamma}$	$J_{1\delta}$
	Smoking habits	Never-smokers	$K_{0\alpha}$	$K_{0\gamma}$	$K_{0\delta}$
		Ex-smokers/smokers	$K_{1\alpha}$	$K_{1\gamma}$	$K_{1\delta}$
	Cigarette consumption	Daily cigarette consumption	$L_{1\alpha}$	$L_{1\gamma}$	$L_{1\delta}$
	Physical activity at work	Does not work	$M_{0\alpha}$	$M_{0\gamma}$	$M_{0\delta}$
		Sitting	$M_{1\alpha}$	$M_{1\gamma}$	$M_{1\delta}$
		Standing and walking	$M_{2\alpha}$	$M_{2\gamma}$	$M_{2\delta}$
		Standing and walking, but also climbs stairs	$M_{3\alpha}$	$M_{3\gamma}$	$M_{3\delta}$
		Heavy physical labour	$M_{4\alpha}$	$M_{4\gamma}$	$M_{4\delta}$
	Total physical activity	METs per hour	$N_{1\alpha}$	$N_{1\gamma}$	$N_{1\delta}$
	Sleeping	Number of sleeping hours per week	$O_{1\alpha}$	$O_{1\gamma}$	$O_{1\delta}$
Medical Care	**Diseases needing medical care**	Yes	$P_{0\alpha}$	$P_{0\gamma}$	$P_{0\delta}$
		No	$P_{1\alpha}$	$P_{1\gamma}$	$P_{1\delta}$
	Medical facilities attended	No attendance	$Q_{0\alpha}$	$Q_{0\gamma}$	$Q_{0\delta}$
		Primary Care Centres	$Q_{1\alpha}$	$Q_{1\gamma}$	$Q_{1\delta}$
		Physician's Private Offices	$Q_{2\alpha}$	$Q_{2\gamma}$	$Q_{2\delta}$
		Hospital	$Q_{3\alpha}$	$Q_{3\gamma}$	$Q_{3\delta}$
		Other Facilities	$Q_{4\alpha}$	$Q_{4\gamma}$	$Q_{4\delta}$
Health	**Health Perception**	GHP score (0,100)	GHP_{α}	GHP_{γ}	GHP_{δ}
		$s_i\,(-\infty, +\infty)$	s_{α}	s_{γ}	s_{δ}

3.3 ESTIMATION METHOD

Health perception is estimated as a MLRM (Multiple Linear Regression Model), a standard statistical tool that regresses *x* independent variables against a single dependent variable, in this case GHP. The generic form of the model is the following Eq. (3. 2):

$$GHP = f\ (x_1, x_2, \dots, x_k) + \varepsilon \tag{3. 2}$$

where $x_1, x_2, \dots, x_k$ are the independent (explanatory) variables. The term ε corresponds to the random disturbance. Following all this, *GHP* is the regressand and x_k, *k* = 1, ... and K are the regressors or covariates (Eq. (3. 3**)**:

$$GHP = x_1\beta_1 + x_2\beta_2 + \cdots + x_k\beta_k + \varepsilon \tag{3. 3}$$

And so, we assume that each observation in the sample $(GHP_i, x_{i1}, x_{i2}, \dots, x_{ik})$, *i* = 1, ..., *n*, is generated by an underlying process described by Eq. (3. 4):

$$GHP_i = x_{i1}\beta_1 + x_{i2}\beta_2 + \cdots + x_{ik}\beta_k + \varepsilon_i \tag{3. 4}$$

The observed value of GHP_i is the sum of two parts, a deterministic part and the random part, ε_i.

In line with this, using our predictors the health production function, Eq. (3. 5), is defined as follows:

$$\begin{aligned} GHP_i = {} & A_{1i}\beta_{A_1} + B_{1i}\beta_{B_1} + C_{1i}\beta_{C_1} + C_{2i}\beta_{C_2} + C_{3i}\beta_{C_3} + D_{1i}\beta_{D_1} + D_{2i}\beta_{D_2} \\ & + D_{3i}\beta_{D_3} + E_{1i}\beta_{E_1} + F_{1i}\beta_{F_1} + F_{2i}\beta_{F_2} + F_{3i}\beta_{F_3} + F_{4i}\beta_{F_4} \\ & + F_{5i}\beta_{F_5} + F_{6i}\beta_{F_6} + G_{1i}\beta_{G_1} + H_{1i}\beta_{H_1} + I_{1i}\beta_{I_1} + J_{1i}\beta_{J_1} \\ & + K_{1i}\beta_{K_1} + L_{1i}\beta_{L_1} + M_{1i}\beta_{M_1} + M_{2i}\beta_{M_2} + M_{3i}\beta_{M_3} \\ & + M_{4i}\beta_{M_4} + N_{1i}\beta_{N_1} + O_{1i}\beta_{O_1} + P_{1i}\beta_{P_1} + Q_{1i}\beta_{Q_1} + Q_{2i}\beta_{Q_2} \\ & + Q_{3i}\beta_{Q_3} + Q_{4i}\beta_{Q_4} + \varepsilon_i \end{aligned} \tag{3. 5}$$

In our study we use a specification of the MLRM, called Stepwise regression, which is a variation from the standard multiple regression option. More precisely we use the Forward Selection Method, so that after each step in which a variable is added,

all candidate variables in the model are checked to see if their significance has been reduced below the tolerance level we specified. More precisely, predictor variables are entered into the regression equation one at a time, and at each step in the analysis the predictor variable that contributes the most to the prediction equation in terms of increasing the multiple correlation, R, is entered first. This process continues only if additional variables add anything statistically to the regression equation, and so, when no additional predictor variables add anything statistically meaningful to the regression equation, the analysis stops. The reason for using this design comes from this model being especially useful for sifting through large numbers of potential independent variables, as it is the case in our data set.

Our MLRM predicts variables with various types of probability distributions by fitting a linear predictor function to some sort of arbitrary transformation of the expected value of the variable. The intuition for transforming using a logit function (the natural log of the odds) has the practical effect of converting the probability (which is bounded to be between 0 and 1) to a variable that ranges over $(-\infty, +\infty)$ thereby matching the potential range of the linear prediction function. In line with this we transformed GHP into p_i according to the Eq. (3. 6):

$$p_i = \frac{GHP_i}{100} \tag{3. 6}$$

The value of s_i is obtained from Eq. (3. 7):

$$s_i = \ln\left(\frac{p_i}{1-p_i}\right), \quad 0 \leq p_i \leq 1 \tag{3. 7}$$

Statistical results are reported in two parts: the full sample estimations and the age groups samples estimations, which are presented in three separate age-groups (one for individuals up to 35 years, other for 36-55 years and the last one for more than 55 years).

In order to measure the time influence of the diferente covariates on the perception of health we first obtained the difference on perception, d_i, according to the following formula Eq. (3. 8):

$$d_i = \ln\left(\frac{p_{i\,2nd\,eval}}{1-p_{i\,2nd\,eval}}\right) - \ln\left(\frac{p_{i\,1st\,eval}}{1-p_{i\,1st\,eval}}\right) = s_{i\,2nd\,eval} - s_{i\,1st\,eval} \qquad (3.\ 8)$$

The observed value of d_i is the sum of two parts, a deterministic part and the random part, ε_i, as we can see in Eq. (3. 9):

$$d_i = (x_{i1\,2nd\,eval} - x_{i1\,1st\,eval})\beta_1 + \cdots + (x_{ik\,2nd\,eval} - x_{ik\,1st\,eval})\beta_k + \varepsilon_i \qquad (3.\ 9)$$

Therefore, we estimate the influence of each variable on the perception difference between 2nd and 1st evaluation.[57]

The specific statistical analysis details are addressed in the next subchapter (3.4).

[57] Only for this analysis we use the Enter Method of the MLRM.

3.4 STATISTICAL ANALYSIS

Statistical analysis included descriptive statistics measures (absolute and relative frequency, mean and standard deviation) and inferential statistics. For the last one it was used Student's t test for paired samples and the MLRM.

The assumptions of this model, namely the linearity of the relationship between independent variables and the dependent variable (graphical analysis), residuals independence (Durbin-Watson test), normality of residuals (Kolmogorov-Smirnov)[58], multicollinearity (VIF (Variance Inflation Factor) and Tolerance) and homogeneity of variances (graphical analysis) were analysed and were generally satisfied. Qualitative variables have been transformed into Dummy variables.

It was used as reference, to accept or reject the null hypothesis, a significance level (α) $\leq$ 0.05. However, significant differences of (α) $\leq$ 0.10 have also been commented.

Statistical analysis was performed with IBM® SPSS® (Statistical Package for the Social Sciences) Statistics version 22.0 for Windows. Outputs are presented in the Annexes section – Anexes B, C and D.

[58] Shapiro–Wilk test was also performed.

4. RESULTS

4.1 SAMPLE CHARACTERISTICS

Detailed results can be checked in Annexes B.

In this investigation there has been the collaboration of 1682 individuals, 99,5 % of them were Caucasians. The majority were female (62.0 %, n = 1047), while male gender was represented by the remaining 38.0 % (n = 635), as it can be seen by observing the Figure 5.

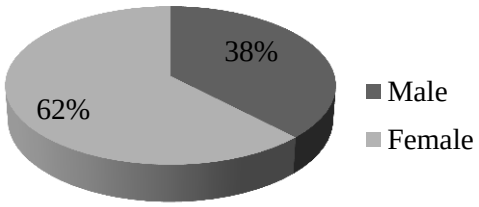

Figure 5 – Sample Distribution by Gender.

The following analysis concerns the follow-up evaluation of the cohort.

The mean age was 57.4 years (SD = 14.8 years). The youngest person was 20 and the oldest 93 years old. The distribution of subjects by age can be assessed on the Figure 6. The predominant age group was the one between level 51 and 60 (25.7 %). The youngest group represented 5.3 % of total respondents, and the oldest one 3.4 %.

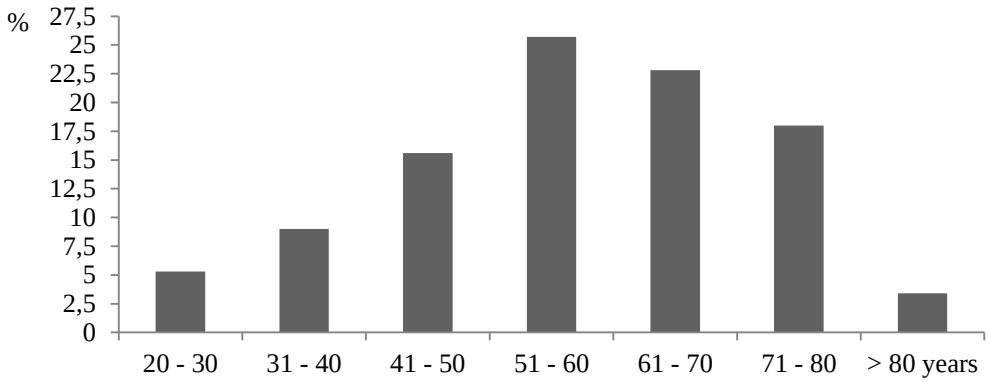

Figure 6 – Sample Distribution by Age Groups.

In terms of marital status, 68.0 % were married, 14.0 % widowed, and 11.0 % single and 7.0 % divorced (Figure 7).

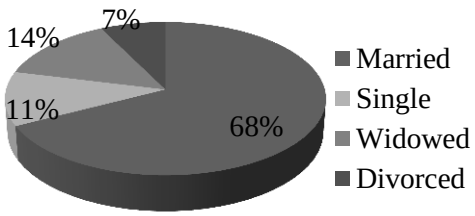

Figure 7 – Sample Distribution by Marital Status.

Regarding education, average schooling was 9 years (SD= 5.2 years), ranging between a minimum of zero years and 25 years of schooling, as we see in Table 2.

Table 2 – Schooling

	N	Minimum	Maximum	Mean	Std. Deviation
Schooling	1679	0	25	9,02	5,26

The most represented occupations were: retired (42.7 %), professional occupations (13.3 %) and skilled non-manual occupations (9.9 %) - Table 3.

Table 3 – Occupation

	Frequency	Percent	Valid Percent
Professional Occupations	223	13,3	13,3
Managerial and technical occupations	146	8,7	8,7
Skilled non-manual occupations	167	9,9	10,0
Skilled manual occupations	11	,7	,7
Partly-skilled occupations	75	4,5	4,5
Unskilled Occupations	78	4,6	4,7
Others (retired, invalid...)	719	42,7	43,0
No occupation, Domestic	155	9,2	9,3
Unemployed	81	4,8	4,8
Students	18	1,1	1,1
Total	1673	99,5	100,0
Missing	9	,5	
Total	1682	100,0	

Concerning working hours per week, the average was 38,7 hours (SD=11,3 hours), with a minimum range of 1 hour and maximum 60 hours (Table 4).

Table 4 – Weekly Working Hours

	Minimum	Maximum	Mean	Std. Deviation
Weekly Working Hours	1	60	38,73	11,35

In terms of BMI, most of the individuals were overweight or obese (65.9 %), while skinny only represented 1.1 % of the total respondents (Figure 8).

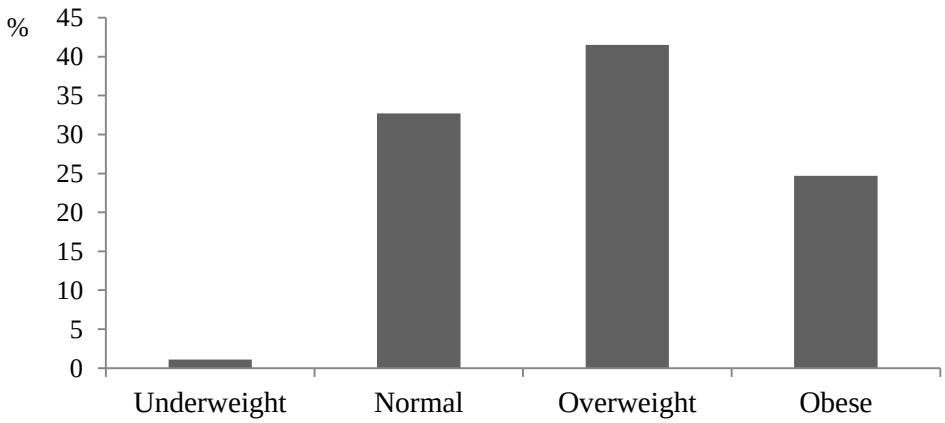

Figure 8 – Sample Distribution by BMI.

Concerning physical activity at work, only 23.8 % from the total amount of respondents are sitting. The remaining ones have some kind of physical activity (excluding the ones who do not work) as it can be seen in Table 5.

Table 5 – Physical activity at work

	Frequency	Percent	Valid Percent
Does not work	747	44,4	48,8
Sitting	364	21,6	23,8
Standing and walking	304	18,1	19,9
Standing and walking, but also climbs stairs	96	5,7	6,3

Heavy physical labour	20	1,2	1,3
Total	1531	91,0	100,0
Missing	152	9,0	
Total	1682	100,0	

The majority confirmed performing housework (67.9 %) - Table 6.

Table 6 – Housework

	Frequency	Percent	Valid Percent
Yes	534	31,7	32,1
No	1129	67,1	67,9
Total	1663	98,9	100,0
Missing	19	1,1	
Total	1682	100,0	

Concerning physical activity, the average was 1,373 METs per hour (Table 7).

Table 7 – Physical Activity

	Minimum	Maximum	Mean	Std. Deviation
Total Physical Activity (METs per hour)	1,0	4,292	1,373	0,577

Regarding alcohol intake, most of the individuals affirmed drinking alcoholic beverages (83,4 %) - Table 8. For those, the average was 19.3 g/day (SD = 21.6 g/day) ranging between a minimum of 1 gram and a maximum of 129 grams (Table 9).

Table 8 – Alcohol Consumption

	Frequency	Percent	Valid Percent	Cumulative Percent
No	262	15,6	15,7	15,7
Yes	1403	83,4	84,3	100,0
Total	1665	99,0	100,0	
Missing	17	1,0		
Total	1682	100,0		

Table 9 – Alcohol Intake Amount

	Minimum	Maximum	Mean	Std. Deviation
Alcohol Intake (g/day)	1	129	19,31	21,56

By the analysis of Table 10, most of the individuals stated no smoking habits (55.5 %). Within the ones who answered "yes", the average reported smoking almost a pack of cigarettes per day (18 cigarettes), like Table 11 shows.

Table 10 – Smoking Habits

	Frequency	Percent	Valid Percent	Cumulative Percent
No	931	55,4	55,5	55,5
Yes	747	44,4	44,5	100,0
Total	1678	99,8	100,0	
Missing	4	,2		
Total	1682	100,0		

Table 11 – Cigarette Consumption

	Minimum	Maximum	Mean	Std. Deviation
Number of cigarettes smoked per day	1	80	18,75	12,58

The results regarding sleeping habits can be checked in Table 12.

Table 12 – Sleeping

	Minimum	Maximum	Mean	Std. Deviation
Number of sleeping hours per day	3	14	7,64	1,44

More than 2/3 of the respondents indicated they had an illness that required regular medical care (Table 13).

Table 13 – Illness requiring regular medical care

	Frequency	Percent	Valid Percent	Cumulative Percent
No	534	31,7	32,1	32,1
Yes	1129	67,1	67,9	100,0
Total	1663	98,9	100,0	
Missing	19	1,1		
Total	1682	100,0		

Like it shows Table 14, the most used medical facility when needed were Primary Care Centers (61,8 %). It is also important to emphatize that 2,4 % of the individuals proclaimed they would not attend any healthcare institution.

Table 14 – Medical Facilities Usually Attended

	Frequency	Percent	Valid Percent	Cumulative Percent
No attendance	39	2,3	2,4	2,4
Primary Care Centres	1016	60,4	61,8	64,1
Physician's Private Offices	270	16,1	16,4	80,5
Hospital	87	5,2	5,3	85,8
Other Facilities	233	13,9	14,2	100,0
Total	1645	97,8	100,0	
Missing	37	2,2		
Total	1682	100,0		

The values obtained for the GHP given by the SF-36 survey are synthetized in Table 15.

Table 15 – Health Perception

	N	Minimum	Maximum	Mean	Std. Deviation
GHP 0-100 score	1276	5	97	59,35	19,16

4.2 EVOLUTION OF THE SAMPLE

Detailed results, namely paired samples statistics, correlations and tests can be checked in Annexes C.

Education

As we see in Table 16, from the 1st to the 2nd assessment there was a significant increase (8.87 vs 9.03) in the mean number of years of schooling, t (1675) = -4.086, p =, 000. For specific details please check Annex C1.

Table 16 – Significance of Differences: Education

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
Schooling	8,87	5,16	9,03	5,26	,000*

*** $p \leq ,001$

Working Hours

From the 1st to the 2nd assessment there was a significant decrease (22.98 vs 19.49) in the average number of hours worked per week by the respondents (Table 17), t(1446) = 7,716, p =, 000. For specific details please check Annex C2.

Table 17 – Significance of Differences: Working Hours

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
Working Hours	22,98	20,4	19,49	20,82	,000 ***

*** $p \leq ,01$

Alcohol

Like it is showed in Table 18, from the 1st to the 2nd assessment there was a significant decrease (20.73 vs 13.11) in the average number of daily grams of alcohol ingested, t (1483) = 11.440, p =, 000. For specific details please check Annex C3.

Table 18 – Significance of Differences: Alcohol

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
Alcohol	20,73	32,55	13,11	19,99	,000 ***

*** $p \leq ,01$

Smoking

From the 1st to the 2nd assessment there was an increase (18,48 vs 18,74) on the number of cigarettes smoked per day (Table 19), although the difference was not statistically significant, t(689) = -0,693, p = ,489. For specific details please check Annex C4.

Table 19 – Significance of Differences: Smoking

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
Nº of cigaretts	18,48	13,64	18,74	12,62	,489

Sleeping Hours

Through the analysis of Table 20, there was a significant decrease (7,78 vs 7,62) in the average number of sleeping hours per day from the 1st to the 2nd assessment by the respondents, t(1446) = 7,716, p =, 000. For specific details please check Annex C5.

Table 20 – Significance of Differences: Sleeping

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
Sleeping Hours	7,78	1,5	7,62	1,4	,000 ***

*** $p \leq ,01$

Physical Activity

There is represented in Table 21 a significant decrease (1,557 vs 1,537), from the 1st to the 2nd assessment, in the METs per hour, t(1346) = 2,364, *p* = ,018. For specific details please check Annex C6.

Table 21 – Significance of Differences: Physical Activity

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
METs per hour	1,557	0,329	1,537	0,313	,018*

* $p \leq ,05$

Health

From the 1st to the 2nd assessment there was an increase (60.79 vs 61.00) on health perception, as we seen in Table 22, although the difference was not statistically significant, t(868) = -0.397, p =, 692. For specific details please check Annex C7.

Table 22 – Significance of Differences: Health

	1st Evaluation		2nd Evaluation		
	M	SD	M	SD	Sig.
GHP 0-100 score	60,79	18,5	61,00	15,58	,692

*** $p \leq ,01$

4.3 MULTIPLE LINEAR REGRESSION ANALYSIS

Detailed results, namely the model summary, ANOVA, coefficients, excluded variables, collinearity diagnostics, residuals statistics and charts (histogram, normal p-plot of regression standardized residual, scatterplots and partial regression plots) can be checked in Annexes D.[59]

4.3.1 GHP PREDICTORS OF THE 1ST EVALUATION

The model of multiple linear regression with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable explains 5.0 % of the latter variable (Table 23) and is statistically significant F (3, 958) = 16.796, p =, 000.[60]

The variables age (β = -, 165) t (958) = -5.199, p =, 000, sleeping hours (β = -, 135) t (958) = -4.285, p =, 000 and professional occupations (β =, 068) t (958) = 2,087, p =, 037, were significant predictors of perceived health. The higher the age and more sleeping hours reflect in a lower health perception, and respondents with professional occupations get higher values in health perception. For specific details please check Annexes D1 and D8.

Table 23 – Stepwise Regression for Full sample from the1st Evaluation

Predictors	**ΔR^2**	**Beta**	
Step 1	,027 (,026)		
Age		-,165***	(-,160***)
Step 2	,019 (,018)		
Age		-,159***	(-,154***)
Sleeping hours		-,135***	(-,136***)

[59] In all the tables of this subchapter, the values within brackets correspond to the regression against the modification of the dependent variable that has been given the name s_i in subchapter 0.
[60] The model with s_i as dependent variable is statistically significant F (3, 944) = 16.677, p =, 000.

Step 3	,004 (,006)			
Age			-,141***	(-,132***)
Sleeping hours/day			-,136***	(-,136***)
Professional Occupations			,068*	(,083*)
Total R^2	,050	(,050)		
F	16,796***	(16,677***)		

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

Individuals younger than 36 years

The model of multiple linear regression for individuals with less than 36 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable explains 9.0 % (Table 24) of the latter variable and is statistically significant F (2, 144) = 7.145, p = .001.[61]

The variables Skilled non-manual occupations (β = -, 230) t (144) = -2.850, p = .005, and Diseases (β = -, 193) t (144) = -2.428, p =, 016, proved to be significant predictors of perceived health. Subjects exerting skilled non-manual occupations and those with diseases requiring regular medical care got significantly lower valuables of health perception. For specific details please check Annexes D2 and D9.

Table 24 – Stepwise Regression for < 36 years sample, from the1st Evaluation

Predictors	**ΔR^2**		**Beta**	
Step 1	,053 (,046)			
Skilled non-manual occupations			-,230**	(-,215*)
Step 2	,037 (,027)			
Skilled non-manual occupations			-,223**	(-,209*)
Diseases			-,193*	(-,165*)
Total R^2	,090	(,073)		
F	7,145**	(5,552**)		

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

[61] The model with s_i as dependent variable is statistically significant F (2, 140) = 5.552, p = .005.

Individuals with 36 - 55 years

The model of multiple linear regression for individuals with 36 to 55 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable explains 2,6 % (Table 25) of the latter variable and is statistically significant F (2, 399) = 5,302, p = ,005.[62]

The variables age (β = -,113) t(399) = -2,279, *p* = ,023, and sleeping hours (β = -,193) t(399) = -2,314, *p* = ,021, revealed to be significant predictors of perceived health. The higher the age and more sleeping hours reflect in a lower health perception.[63]

For specific details please check Annexes D3 and D10.

Table 25 – Stepwise Regression for 36 - 55 years sample, from the 1st Evaluation

Predictors	**ΔR^2**	**Beta**	
Step 1	,013 (,011)		
Age		-,113*	(-,104*)
Step 2	,013 (,010)		
Age		-,115*	(-,106*)
Sleeping hours		-,114*	(-,103*)
(Step 3)	(,012)		
(Age)			(-,106*)
(Sleeping hours)			(-,106*)
(Skilled non-manual occupations)			(,105*)
Total R^2	,026	(,033)	
F	5,302**	(4.440**)	

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

[62] The model with s_i as dependent variable is statistically significant F (3, 396) = 4.440, p = .004.
[63] In the model with s_i as dependent variable, subjects exerting skilled non-manual occupations expressed lower health perception.

Individuals over 55 years

The model of multiple linear regression for individuals aged over 55 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable explains 2,8 % (Table 26) of the latter variable and is statistically significant F (1, 411) = 11,707, p = ,001.[64]

The variable sleeping hours (β = -, 166) t (411) = -3.422, p = .001, proved to be a significant predictor of perceived health. The more the subject sleeps the lower is the perception of health.[65] For specific details please check Annexes D4 and D11.

Table 26 – Stepwise Regression for > 55 years sample, from the 1st Evaluation

Predictors	**ΔR^2**	**Beta**	
Step 1	,028 (,031)		
Sleeping hours		-,166***	(-,177***)
(Step 2)	(,012)		
(Sleeping hours)			(-,158**)
(Total physical activity)			(,111*)
(Step 3)	(,012)		
(Sleeping hours)			(-,166**)
(Total physical activity)			(,115*)
(Managerial and technical occupations)			(,108*)
Total R^2	,028	(0,055)	
F	11,707***	(7,716***)	

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

4.3.2 GHP PREDICTORS OF THE 2ND EVALUATION

The model of multiple linear regression with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care,

[64] The model with s_i as dependent variable is statistically significant F (3, 401) = 7.716, p = .000.
[65] In the model with s_i as dependent variable, the more the amount of physical activity pertrained by the subject (expressed in METs per hour) the higher is the health perception. Also, the subjects exerting managerial and technical occupations expressed higher health perception.

medical facilities usually attended as independent variables and the GHP as the dependent variable explains 6.6 % (Table 27) of the latter variable and is statistically significant F (1, 273) = 19,215, p = ,000.[66]

The variable age (β = -, 256) t (273) = -4.383, p =, 000, proved to be a significant predictor of perceived health. The higher the age, the lower is the perception of health. For specific details please check Annexes D5 and D12

Table 27 – Stepwise Regression for Full sample from the 2nd Evaluation

Predictors	**ΔR^2**	**Beta**
Step 1	,066 (,056)	
Age		-,256*** (-,236***)
Total R^2	,066 (,056)	
F	19,215*** (16,034***)	

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

Individuals younger than 36 years

The model of multiple linear regression for individuals with less than 36 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable is not statistically significant.[67]

Individuals with 36 - 55 years

The model of multiple linear regression for individuals with 36 to 55 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent

[66] The model with s_i as dependent variable is statistically significant F (1, 271) = 16.034, p = .000.
[67] The model with s_i as dependent was not statistically significant too.

variables and the GHP as the dependent variable explains 15,4 % (Table 28) of the latter variable and is statistically significant F(4, 158) = 7,175, p = ,000.[68]

The variables age (β = -, 246) t (158) = -2.226, p = .002, sleeping hours (β = -, 166) t (158) = -2.200, p =, 029, married (β = -, 182) t (158) = -2.422, p =, 017 and Physician's Private Offices (β = -, 187) t (158) = -2.482, p =, 014 were significant predictors of perceived health.

The higher the age and more sleeping hours reflect in a lower health perception. Married individuals and those attending private clinics also evidence lower levels of perceived health.

For specific details please check Annexes D6 and D13

Table 28 – Stepwise Regression for 36 - 55 years sample, from the 2nd Evaluation

Predictors	**ΔR^2**	**Beta**	
Step 1	,061 (,057)		
Age		-,246**	(-,238**)
Step 2	,027 (0,031)		
Age		-,238**	(-,228**)
Sleeping hours		-,166*	(-,178*)
Step 3	,033 (,032)		
Age		-,255*	(-,245**)
Sleeping hours		-,181*	(-,193*)
Married		-,182*	(-,178*)
Step 4	,033 (,042)		
Age		-,263***	(-,255**)
Sleeping hours		-,181*	(-,192**)
Married		-,226**	(-,229**)
Physician's Private Offices		-,187*	(-,212**)
Total R^2	,154	(,162)	
F	7,175***	(7,644***)	

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

[68] The model with s_i as dependent variable is statistically significant F (4, 158) = 7.644, p = .000.

Individuals over 55 years

The model of multiple linear regression for individuals aged over 55 years, with the variables gender, age, marital status, BMI, education, working and sleeping hours, physical activity, tobacco and alcohol behaviours, occupation, housework, diseases requiring regular medical care, medical facilities usually attended as independent variables and the GHP as the dependent variable explains 9,0 % (Table 29) of the latter variable and is statistically significant F (1, 56) = 5,521, p = ,022.[69]

The variable Diseases (β = -,300) t(56) = -2,350, p = ,022, proved to be a significant predictor of perceived health. Subjects suffering from diseases requiring regular medical care got significantly lower valuables of health perception.

For specific details please check Annexes D7 and D14

Table 29 – Stepwise Regression for > 55 years sample, from the 2nd Evaluation

Predictors	**ΔR^2**	**Beta**
Step 1	,090 (,096)	
Diseases		-,300* (-,310*)
Total R^2	,090 (,096)	
F	5,521* (5,933*)	

* $p \leq$,05 ** $p \leq$,01 *** $p \leq$,001

4.3.3 BEHAVIOURAL CHANGE EFFECT ON GHP

The model of multiple linear regression with the differences between de answers given at the 2nd Evaluation and 1st Evaluation (variables δ from Table 1) with GHP_δ and s_δ as the dependent variable explains 3.6 and 6.3 % of the latter variables respectively and only for s_δ is statistically significant F (21, 526) = 1.686, p = ,029.

For specific details please check Annexes D15 and D16.

[69] The model with s_i as dependent variable is statistically significant F (1, 56) = 5.933, p = .018.

Table 30 – Regression for Full sample for the Difference between Evaluations

Predictors	Beta
$A_{1\delta}$	-,022 (-,103*)
$D_{1\delta}$	-,009 (-,054)
$D_{3\delta}$	-,041 (-,090*)
$C_{1\delta}$	-,274 (-,488)
$C_{2\delta}$	-,285 (-,522)
$C_{3\delta}$	-,318 (-,544)
$E_{1\delta}$	-,001 (-,028)
$F_{1\delta}$	,023 (,014)
$F_{2\delta}$	-,049 (-,031)
$F_{3\delta}$	-,061 (-,040)
$F_{5\delta}$	,052 (,039)
$F_{6\delta}$	-,013 (,006)
$G_{1\delta}$	,046 (,062)
$H_{1\delta}$	-,056 (-,031)
$N_{1\delta}$	-,063 (-,044)
$J_{1\delta}$	-,066 (-,124*)
$O_{1\delta}$	-,002 (,048)
$Q_{1\delta}$	-,025 (,007)
$Q_{2\delta}$	-,056 (-,068)
$Q_{3\delta}$	-,049 (-,051)
$B_{1\delta}$	,093* (,089*)
R^2	,036 (,063)
F	1,070 (1,686*)

* $p \leq ,05$ ** $p \leq ,01$ *** $p \leq ,001$

4.4 DISCUSSION

The main objective of this study was to elaborate a function that estimates the production of health in adult subjects, and consequently determine which variables influence it and in what direction. More specifically, in our case, health capital was assessed with the SF-36, as the perception of health, GHP. For this purpose it was used a database kindly provided by EPIPorto project, which included (regarding our intents) variables concerning biological (age, gender, race, BMI), socioeconomic (marital status, education, occupation, housework, working hours, alcohol consumption, cigarette consumption, physical activity, sleeping) and healthcare (diseases needing medical care, medical facilities) aspects, as well as the GHP for each individual. All variables described, and others not mentioned, were subject of two temporal reviews.

Given the known effect of age on health and health perception it was decided to develop three distinct models, which correspond to three age groups easily identified with the effect previously stated: up to 35 years, 36-55 years and subjects with more than 55 years. Thus, as there are two moments of evaluation, 8 different models, two from each age group and two global, were tested. The fundaments for this option relied on the necessity to analyse the pattern of invariance of the significant predictor variables and to improve the sensitivity and robustness of the model.[70] We also scrutinised the consequences of time behaviour changings by analysing differences between de answers given at the 2nd Evaluation and 1st Evaluation (variables δ from Table 1).

The explained variance of the models ranged from a minimum of 2.6 % and a maximum of 15.4 %. This low proportion may possibly be explained by the subjectivity of the evaluation of health perception and probably also by the need of including as estimators other variables not included in this study.[71] Because practice is a good counsellor, maybe future studies should further subdivide the analysis, namely creating specific models by gender.

The variable "age" is highlighted as a significant estimator of health perception in 4 of the 8 models tested and in all of them, the respective regression coefficient is negative (Table 23, Table 25, Table 27, Table 28).[72] Therefore, in our research, the higher the age, the lower is the perception of health. This finding confirms the results described in the literature about the fact that the older individuals have lower levels of health perception. One of the explanations may be related with the higher prevalence of chronic diseases and functional limitations that, with advancing age, tend to affect the perception of health (Gorres, 1996). As previously mentioned in the literature review chapter, a study conducted in Portugal concluded that the HRQL (and consequently the perception of health) decreases with increasing age of the individuals (Figueiredo and Cardoso, 2014). These authors only studied individuals aged over 35 years and divided their sample into four classes according to the age of the participants (the 1st included individuals aged 35-45 years, 45-55 years for the 2nd, the 3rd 55-65 years and the 4th for individuals aged over 65 years), concluding that individuals aged 55 or more had a

[70] Stratifying the analysis by age led to decreases in the sample size in some categories.
[71] These limitations and others are addressed latter in this subchapter.
[72] Difference of ages ($A_{1\delta}$) also proved to be a significant predictor of health perception diference (please ckeck Table 30).

lower perception of their health, either physical or mental. Internationally, the evidence goes in the same direction too. The national health survey held in Colombia in 2007, aimed to analyse the self-reported perceived health related to socio-demographic characteristics, social health inequalities and social capital, found that among male individuals (aging 28 and upward) the perception of health is negative and tends to deterioration with age, over the years. Regarding women, the results were similar to those for males and suggest that from 38 years old it occurs a decline in the perception of health which tends to deteriorate with aging (Tuesca-Molina and Amed-Salazar, 2014). Also a study conducted in South Korea, aimed to determine the factors associated with the perception of health among adolescents in that country concluded that age was statistically significantly associated with the perception of health by individuals. In this study only individuals aged 16 to 18 years were evaluated, but, according to the results, with increasing age there is a decreased perception of health by individuals, which meets the outcome found in our study. More specifically, the authors determined that the aging of one year would decrease 16% the odds of the health perception of the individual on himself (Chun et al., 2014).

Health perception is the proxy for health capital in our study. Consequently, in this conceptual framework, the death of an individual is determined endogenously by the choice of values such that the health drops below a minimum survival level. This choice depends crucially on how the rate of depreciation of health stock evolves with the age of the individual. In particular makes sense to think that the health of older people deteriorates faster than the health of young people. The acceleration of this rate of depreciation with age will contribute to the fact that at old ages health status falls below the survival threshold. This finding is consistent with the economic theory on the demand for health, which predicts that health decreases with age. As illustrated in Figure 9, although age does not influence MBHC, due to the higher depreciation rate, the supply curve shifts upwards ($MCHC_B$ to $MCHC_A$).

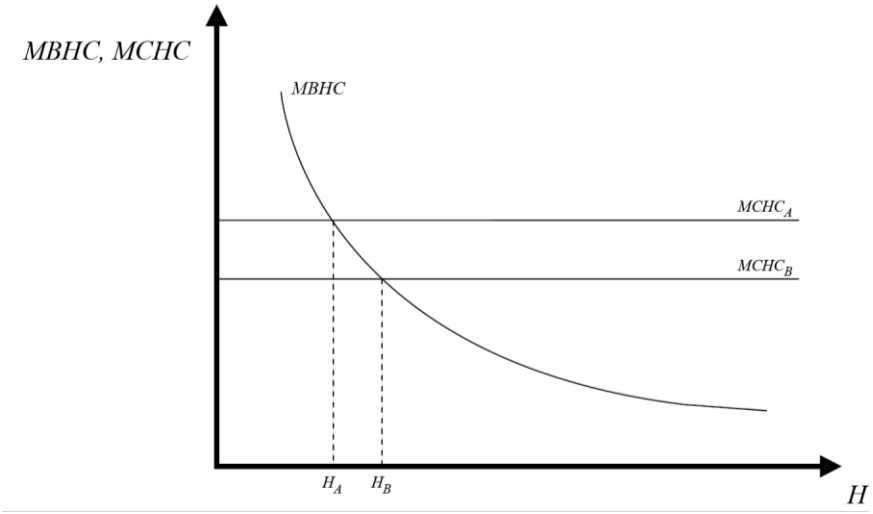

Figure 9 – Effect of age on health

The variable "sleeping hours" also appears as a significant estimator of health perception in 4 of the 8 models tested, and in all of them its respective regression coefficient is negative (Table 23, Table 25, Table 26, Table 28). Likewise, the higher the number of daily hours of sleep, the lower is the evaluation of the perception that subjects carry on their health.

Most of the literature refers to sleep deprivation (poor quality, short duration), as an negative influence on the perception of health (Leger et al, 2012; Lo and Lee, 2012; Lima, 2012b). In a recent research aimed to assess the relationship between sleep and health perception (Lekander et al., 2013), the authors manipulated participants' sleep for five days, in which they were allowed to sleep only four hours a night and concluded that changes in the duration of sleep and increased fatigue are directly related with the perception of health by individuals. Thus it was found that as the duration of the sleeping period decreases, fatigue increases and reduces the perception of the state of health of individuals. Nevertheles, maybe it is the moment to invoque the famous Hippocraticum saying that "Everything in excess is opposed to nature", and sleeping seems not to be an exception. The bulk of the literature supports that habitually long sleep duration is an indicator of poor health status, but this topic only recently came to light and so it offers only weak evidence that extension of sleep, as an optional or directly modifiable behavior, is a driving causal force in patterns of health capital (Chien et al., 2010). Nevertheless, it appears dubious that habitual extension of sleep

beyond optimal levels is a common behavior in otherwise healthy adults. A recent research found that elderly men with long sleep pattern, more precisely individuals who slept for 10 or more hours a day obtained worse mean scores for almost all the SF-36 scales (Lima et al., 2012a). Another study suggested a U-shaped relationship between sleep duration and health outcome behaviors in the elderly population (Tsou, 2011). There is also some evidence that points strong association between mortality and long sleep duration patterns (Castro-Costa et al., 2011; Grandner and Drummond, 2007; Mesas et al., 2010).

Although our study relys on self-reported information, it should be noted that, at least for this variable, a great number of population-based studies have used this type of information and other studies have indicated a good correlation between self-reported information and objective sleep measures such as actigraphy, a non-invasive method of monitoring human rest cycles (Gangwisch et al., 2008; Krueger and Friedman, 2009; Lauderdale et al., 2008). Our weak points might be due to the low detail instead, i.e., the lack of information about the time taken to fall asleep, the time spent in bed, difficulty in maintaining sleep or for how long an individual maintains his sleep pattern (Lima et al., 2012a), thus the aswer to our survey question "what is the average number of hours dedicated to sleep per 24 hours", may not be totally reliable. What is clear from the literature is that long sleep duration cannot be assessed as a risk factor without also assessing the potential confounding impact of other health conditions such as depression, sleep apnea, and other physical comorbidities and behaviors (e.g., alcohol consumption) that, through various mechanisms, may manifest themselves through extended sleep duration (Stamatakis and Punjabi, 2007). Despite the lack of comparative studies, it is possible that the individual's occupation in our study should have some influence, as it makes sense to think that having no occupation (unemploiyed, retired or invalid) may lead to lesser social participation and greater isolation, ultimately affecting the sleep duration pattern.[73] Summarizing and to conclude this topic, we truly believe that the associations between sleep duration patterns and and self-assessed health status and other health outcomes among Portuguese individuals brings out the need for greater attention to this topic.

[73] Several reports suggest a greater tendency towards sleep duration patterns of 9 or more hours among unemployed individuals (Lima et al., 2012a).

The variable "occupation" appears as a significant estimator of health perception in 4 models, all from the 1st assessment: the global model (Table 23), and the models for individuals under 36 years (Table 24), between 36 and 55 years (Table 25) and over 55 years (Table 26). In the first case, respondents with professional occupations got higher values in health perception. In the second and third cases subjects with skilled non-manual occupations evidenced respectively lower and higher values on health perception compared with other professionals. In the last case, individuals with managerial and technical occupations got higher values in health perception too.

There is extensive international investigation in what concerns this predictor. A study realized with 733 workers with an average age of 45 years, most of which had an intermediate or high educational level, showed that there was a correlation between the individual health perception and the working capacity, wherein the greater the perception of health the higher was the work capacity. Furthermore, it was concluded that the individual health perception and the sickness absence was related with health behaviors that employees had (such as physical exercise) and not only with the working capabilities of the workers (Rongen et al., 2014).

A slightly different study whose participants were nurses in Taiwan, showed that they had a moderate perception of their health, and that there was a significant relationship between work stress and sleep quality (the higher the stress, the worse is sleep quality) and that the quality of sleep was directly related with the perception of health status (Lin et al., 2014). Meanwhile, a study conducted in Central America with a sample composed mainly by individuals under the age of 50, found several relationships between the type of the occupation and their perception of health (Benavides et al., 2014). The survey made possible the comparison of data on the work and health status of workers in the formal and informal economy of six spanish-speaking countries, based on representative national samples, describing that two-thirds of the workforce reported their health as being either good or very good, despite the scarce extent of social security coverage, working without contract or working more than 48 h per week.

Nevertheless not all the research results go in the same direction. For example, the previously mentioned Colombian study (Tuesca-Molina and Amed-Salazar, 2014) found that women with fewer educational qualifications and unskilled occupations had a

better individual perception of health than those who had skilled jobs (opposite data was found for men).

At portguese nacional level it was found that individuals with precarious employment or professionally inactive tend to present a lower perception of their health status (Figueiredo and Cardoso, 2014).

Thus, we can affirm that most of the literature encounters what was found in our work, ie, there is a relationship between having an occupation and the perception of health by individuals. However, regarding the comparison between the perception of health among individuals with undifferentiated and differentiated occupations, the literature contains contradictory data. In line with this, our finding of lower health perception among individuals under 36 years of age with IIIa ocupations needs to be further enhanced with other studies in the future.

In the concrete case of the model with respect to the subjects 36-55 years of the 2nd assessment (Table 28), the married had significantly lower perception of health when compared to those with other marital statuses, which differs the data from other studies. Anyway, we found that people who became widowed during the time between both assessments decreased their health perception level (Table 30). Worldwide research concludes that people who live alone have lower indices of perception of health when compared with individuals who live together, regardless of gender, both in undeveloped (Tuesca-Molina and Amed-Salazar, 2014) and in developed contries like USA (Xiao and Barber, 2008) or Portugal (Figueiredo and Cardoso, 2014). Even research on immigrants, which usually evidences contradictions is in line with this fact, an example is a recent research in Australia, which revealed that widowed females showed a poorer perception of health than individuals who live together, although this perception varied with the cultural background of individuals (Panagiotopoulos et al, 2013).

The variable "diseases" proved to be a significant predictor of perceived health (Table 24, Table 29). Subjects suffering from diseases requiring regular medical care got significantly lower valuables of health perception. These results are similar to those found in the international (Weldam et al, 2014; Xiao and Barber, 2008) and national literature (Braga et al., 2011; Figueiredo and Cardoso, 2014). In this latest study, where

38.6% of subjects reported having at least one of the following chronic medical conditions: hypertension, arthritis, depression, allergies and rhinitis, it was found a significant negative association between the presence of those diseases and the HRQL of those individuals.

A recent meta-analysis determined that there is a relationship between a weak perception of health and the presence of chronic disease in the elderly, although this relationship may be enhanced by the presence of depression associated with the chronic disease (Chang-Quan et al, 2010). Similar results were found in a study conducted in Beijing (Fang et al., 2003). This association between a poor perception of health and the presence of chronic medical conditions has been found found for various diseases, including: respiratory diseases (Bonsaksenet al., 2014), cardiovascular diseases (Franzen et al., 2007) or diabetes mellitus (Ozcan et al., 2014).

Individuals between 36 and 55 years of age attending physician's private offices also evidenced lower levels of perceived health in our study (Table 28). Generally speaking, evidence shows that individuals with more resources (economic/social), can access a better network of health care provision, including private hospitals, and therefore have a better perception of their health (Tuesca-Molina and Amed-Salazar, 2014). Studies conducted in the USA showed that individuals evidenced a more negative perception of their health if they usually attended a hospital instead of a private clinic (Xiao and Barber, 2008). However the association may not be that clear. Thus, although these studies do not meet the results that we obtained, it is necessary to take into account the unequal distribution of health care in those countries, a reality that may not be applied in our country, making it necessary to take into account the environment of care and access to health care in Portugal. Hereupon, more studies should be conducted in Portugal, in order to assess the perception of the health of patients who rely on the provision of health care in the private sector, more precisely in physician's private offices.

Regarding total physical activity, concerning individuals aged over 55 years the higher was the value of METs per hour, the higher was the perception of health (Table 26).[74] Although it may simply be that unobserved individual heterogeneity has stronger

[74] This result was obtained just in the model with s_i as dependent variable.

links between health perception and the amount of physical activity, it is possible to find in the economical literature numerous papers using a Grossman health production framework, which look at the influence of participation in physical activity on health and thereby confirm our result (Abdul-Rahman, 2008). Althoug the health benefits of physical activity are well documented, its influence on health perception is not that much. McLeod and Ruseskiy (2013), who investigated the longitudinal relationship between participation in physical activity and health outcomes through both a random effects and a dynamic unobserved effect model, using data data from 8 cycles of the Canadian National Population Health Survey, state that if self-reported health is interpreted as a multidimensional measure of health, then their result suggests participation in physical activity may have positive effects on health beyond what is captured by the presence of a single health condition. In Portugal, Barros (2003) estimated a health production function and found that individuals practicing moderate or intense sport activity indicate a better health status than those who do not practice any physical activity. Similar papers showed an inverse association between low self-rated health and leisure-time physical activity, and that HRQL deteriorates in sedentary individuals (Araujo et al. 2011; Figueiredo and Cardoso, 2014). Thus our result seems to confirm Grossman's model predictions of expected positive effects of performing regular physical activity.

In what concers the total alcohol intake, although we didn't find significant correlations between it and health perception, we found that people who started drinking more grams of alcohol per day during the time between both assessments decreased their health perception level (Table 30). This may be explainded by the fact that many of the negative consequences of risk behaviours (in which excessive alcohol intake is included)[75] on individuals' health are observed only some years later. Alcohol use remains a prominent public health problem, being responsible for high levels of morbidity and mortality worldwide. Despite growing problems of global alcohol abuse,

[75] According to O'Keefe et al. (2014), there is abundant epidemiological and clinical evidence showing that light–moderate drinking is associated with better health, particularly with a reduced risk of coronary heart disease, total and ischaemic stroke and total mortality in middle-aged and elderly men and women (The plausible mechanisms for the putative cardioprotective effects include increased levels of high-density lipoprotein cholesterol, decreased levels of low-density lipoprotein cholesterol, prevention of clot formation, reduction in platelet aggregation, and lowering of plasma apolipoprotein(a) concentration). Nevertheless, there are issues of causality and magnitude of effect that may be responsible for the variation of the putative health benefits of light–moderate among individuals (Agarwal, 2002; Patra et al., 2010).

accurate information on the prevalence and pattern of use in Portugal remain sparse. Wale (2008) tested the theoretical implications of the Grossman's health demand model examining the determinants of self-assessed health in Oslo (using data from from the general health Survey: Oslo Health Study) showed that drinking strong alcohol have a negative significant effect on health demand. Because this variable increases depreciation rate of health capital we can affirm that our result confirms Grossman's Model predictions.

Concerning all the other explanatory variables, we were not able to confirm with a reasonable degree of confidence if they had a positive, negative or negligible effect. Anyway, despite evidence in the economic literature that to a certain extent confirms their effect, it is not surprising to note that for education, gender, BMI, housework, working hours, and cigarette consumption, the coefficients do not evidence statistical significance due to the particularities of health perception.

We do feel confident that the overall sampling design, randomisation process and conduction of the statistical analysis decreased several bias, but it is important to emphasize some limitations of the study. One of them concerns the fact that there may be some omitted variables which affect the demand for health and consequently lead to omitted variables bias. This bias is a broad complaint against a causal model in the economical science, and in the typical empirical health production function estimastions specially. Nevertheless, the standard omitted variable bias lesson often concludes with results that show that the inclusion of irrelevant variables produces inefficient coefficient estimates, with many authors denoting that there exists a trade-off between bias and inefficiency when adding variables to a regression specification (Clarke, 2005, 2009).[76]

Another important limitation is regarded to causality. Causal pathways underlying the observed associations cannot be entirely inferred due to the cross-sectional nature of our data. In fact, particularly for some variables there could be problems with reversed causality (e.g. that the health status affects the daily sleeping

[76] However, in practice, health economists are almost never in the position of choosing between including the final relevant variable and including an irrelevant variable, being rather faced with choosing to include an additional relevant variable out of a larger set of relevant omitted variables. In this case, the main question shall be the effect of adding to the multiple linear regressions not all, but some, of these relevant omitted variables.

hours rather than the other way round), and so, the estimated effects for those specific variables would be biased, along with the effects of all other correlated regressors.

Other important issue is related with the fact that our study is based on the answers from self-report questionnaires. Every research where self-report measures are used to draw conclusions about human behaviour, should always take into account the multitude of problems associated with such measures, and how they might impact on the validity of the conclusions that have been drawn. Better understanding of systematic variations in how different groups (according to age, gender, race/ethnicity, and socioeconomic status) both view and report their health has strengthened the value of health status measures (Franks et al., 2003). The recent increase in the popularity of self-report questionnaires has led to a concomitant increase in the validation of this instrument (in our case the SF-36 and EpiPorto questionnaires) and the subsequent assessment of how bias can influence it. Bias associated with self-report questionnaires is fairly usual and might possibly interfere with the outcome of the targeted dimension of health (Bowling et al., 1999; Bajekal et al., 2004; Cook, 2010). In this sense, variations in mode of administration can be a problematic source of study bias, involving (interviewer or interviewee) intentional or unintentional alteration of information collected from the subject (Cook, 2010; Delgado-Rodriquez and Llorca, 2004). One of the complications in evaluating health states arises from the fact that a individual's own understanding of his or her health may not accord with the valuation of research experts, hence, there is a conceptual contrast between "internal" assessments of health (based on the subject's own perceptions) and "external" assessments (researcher side). No doubt that the internal view of health deserves attention, but relying on it in economical research can be extremely misleading. It has been studied extensively that, in general, research participants respond in socially desirable ways, i.e., in a way that makes them look as good as possible, under-reporting behaviors deemed inappropriate by researchers or other observers, and over-reporting behaviors viewed as appropriate (Donaldson and Grant-Vallone, 2002). In our case, particularly, we could have faced among several variables, for example an underestimation of smoking and alcohol consumption and overestimation of physical activity.[77] In order lessen the influences of this reporting bias, but at the same time avoiding the individuals

[77] This phenomenon is known as the *Hawthorne effect.*

to attempt to help us meeting the study goals it was given to the participants an independent explanation of the expected study benefits and purpose, therefore reducing unintentional persuasion toward our specific findings. So, in our opinion, the reliability of the self-reported answers given by the participants in our study is fairly high.

Anyway, although several population-based studies have shown self-perceived health to be a powerful predictor of health outcomes, the extent to which it is associated with personality characteristics is mostly unidentified. As Stephen Hawking once said, "there is no way to remove the observer, us, from our perceptions of the world". In fact some papers have underscored a strong association between self-perceived health and personality characteristics. Goodwin and Engstrom (2002) found it both in subjects with and without self-reported medical problems. Stanton and Campbell (2014) revealed that more anxious persons reported poorer overall physical and mental health, more bodily pain, more medical symptoms, and impaired daily functioning, even after controlling for age, marital quality and neuroticism. More than ever the "external assessment" has come under substantial criticism, particularly from anthropological sides for taking a distanced and less sensitive view of health. Therefore, we are convicted that the challenge remains to make an higher effort for scrutinising the statistics on self perception of health and illness in each contry context by taking note of levels of education and public information, as well as characteristics of healthcare facilities.

Despite the previous mentioned limitations, our work is counterbalanced by several strengths as well. One of the concerns the use of objective measures to characterize individual's behaviour therefor reducing the risk of bias associated with subjective measures, frequently seen as a cause of inconsistencies between studies. Additionally, it was based on a large well-characterized population-based cohort. Eventually, our work fits international, particularly, WHO Regional Committee for Europe demands in terms of the new European policy framework for health and well-being, Health 2020.[78] We estimated the effect of the previously mentioned variables in an easily interpretable way and overall our results confirm and strength substantial

[78] The EAP (European Action Plan) was endorsed by the Regional Committee at its sixty-second session (2012) and will run until 2020 in parallel with Health 2020. The EAP for Strengthening Public Health Capacities and Services presents ten EPHOs (Essential Public Health Operations). In our study we approached some of them, particularly the last one, EPHO10: Advancing public health research to inform policy and practice.

evidence on the predictions of the demand-for-health model with some exceptions, and so, in spite of the previous mentioned limitations we do believe that the results from our study are compelling and provide some support for further empirical Portuguese studies in this field, that might be of economical and clinical interest and relevant to health policy decisors.

5. SUMMARY, CONCLUSION AND FUTURE PERSPECTIVES

This study has tried to investigate the determinants of health status in Portugal, more precisely the health perception predictors, in line with Grossman's theoretical model using biological, socioeconomic and medical care factors as inputs of the production system. The main data source for this study was the EPIPorto project, a population-based study in progress for about 15 years, consisting in a cohort of adults living in Porto, a large urban center in the north-west of Portugal.

The results obtained from our multiple regression models suggest that health perception decreases with age, with the daily hours of sleep and with diseases requiring regular medical care. We also found significant correlations between health perception and the individuals' occupation, marital status, alcohol intake, physical activity and the type of medical facility they usually attended.

Overall, our empirical investigation supports more or less the Grossman's model predictions. Although some of our findings are corroborated by recent economic papers on this field, some others go beyond rational or biological consistency, which might be explained by particularities that reflect potential specificities of the situation in Portugal. Henceforward a better understanding of health and the demand for health by the Portuguese people is required.

As far as health is influenced by individual decisions, the context in which incentives are created and decisions are taken should be the focus when discussing health-related policy issues. In line with this, our findings may serve as a starting point in developing a health policy that is directed toward improving the health status of Portuguese population. Moreover, future research compromising our empirical findings on the topic should shed light on the question of causality between Portuguese individuals' health perception and their caracteristcs and behaviours. Improvements in data supply will definetly facilitate much potencially interesting analysis through the application of the model to different empirical questions to which Portugusese data limitations posed obstacles in the past.

Although the classical framework supports the underlying assumption of individuals' rational behaviour, it is also clear that there is a lot more involved in explaining the individual decision making regarding the health production. Several areas seem particularly promising, and we anticipate that there will be active research over the coming decades in Portugal, giving more importance for example to the time health input property in Grossman's model, to the genetic determinants of health, the comulative effect of individuals' lifestyle and to the emerging field of neuroeconomics.

No doubt that further interdisciplinary work with biomedical researchers working together with health economists will overcome the relative paucity of research on certain health determinants of our population.

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7. ANNEXES

A. 36-ITEM SHORT FORM HEALTH SURVEY

This survey asks for your views about your health. This information will help you keep track of how you feel and how well you are able to do your usual activities.

Answer every question by selecting the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

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1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
○	○	○	○	○

---

2. Compared to one year ago, how would you rate your health in general now?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
○	○	○	○	○

---

3. The following questions are about activities you might do during a typical day. Doesyour health now limit you in these activities? If so, how much?

		Yes, limited a lot	Yes, limited a little	No, not limited at all
a	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	○	○	○
b	Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○	○	○
c	Lifting or carrying groceries	○	○	○
d	Climbing several flights of stairs	○	○	○
e	Climbing one flight of stairs	○	○	○
f	Bending, kneeling, or stooping	○	○	○
g	Walking more than a mile	○	○	○
h	Walking several blocks	○	○	○
i	Walking one block	○	○	○
j	Bathing or dressing yourself	○	○	○

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	○	○
b	Accomplished less than you would like	○	○
c	Were limited in the kind of work or other activities	○	○
d	Had difficulty performing the work or other activities (for example, it took extra effort)	○	○

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

		Yes	No
a	Cut down on the amount of time you spent on work or other activities	○	○
b	Accomplished less than you would like	○	○
c	Did work or other activities less carefully than usual	○	○

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
○	○	○	○	○

7. How much bodily pain have you had during the past 4 weeks?

None	Very mild	Mild	Moderate	Severe	Very severe
○	○	○	○	○	○

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
○	○	○	○	○

9. These questions are about how you feel and how things have been with you during thepast 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the past 4 weeks...

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a	Did you feel full of pep?	○	○	○	○	○	○
b	Have you been a very nervous person?	○	○	○	○	○	○
c	Have you felt so down in the dumps that nothing could cheer you up?	○	○	○	○	○	○
d	Have you felt calm and peaceful?	○	○	○	○	○	○
e	Did you have a lot of energy?	○	○	○	○	○	○
f	Have you felt downhearted and blue?	○	○	○	○	○	○
g	Did you feel worn out?	○	○	○	○	○	○
h	Have you been a happy person?	○	○	○	○	○	○
i	Did you feel tired?	○	○	○	○	○	○

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
○	○	○	○	○

11. How TRUE or FALSE is each of the following statements for you?

		Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a	I seem to get sick a little easier than other people	○	○	○	○	○
b	I am as healthy as anybody I know	○	○	○	○	○
c	I expect my health to get worse	○	○	○	○	○
d	My health is excellent	○	○	○	○	○

Thank you for completing these questions!

Portuguese Version of SF-36 (Applied to the participants of our study)

INSTRUÇÕES: As questões que se seguem pedem-lhe opinião sobre a sua saúde, a forma como se sente e sobre a sua capacidade de desempenhar as actividades habituais. Pedimos que leia com atenção cada pergunta e que responda o mais honestamente possível. Se não tiver a certeza sobre a resposta a dar, dê-nos a que achar mais apropriada e, se quiser, escreva um comentário a seguir à pergunta.

1. Em geral, diria que a sua saúde é:

Óptima	Muito boa	Boa	Razoável	Fraca
○	○	○	○	○

2. Comparando com o que acontecia há um ano, como descreve o seu estado geral actual:

Muito melhor	Com algumas melhoras	Aproximadamente igual	Um pouco pior	Muito pior
○	○	○	○	○

3. As perguntas que se seguem são sobre actividades que executa no seu dia-a-dia. Será que a sua saúde o/a limita nestas actividades? Se sim, quanto?

(Por favor preencha um círculo em cada linha)

	Sim, muito limitado/a	Sim, um pouco limitado/a	Não, nada limitado/a
a. **Actividades violentas,** tais como correr, levantar pesos, participar em desportos extenuantes	○	○	○
b. **Actividades moderadas,** tais como deslocar uma mesa ou aspirar a casa	○	○	○
c. Levantar ou pegar nas compras de mercearia	○	○	○
d. Subir **vários** lanços de escada	○	○	○
e. Subir **um** lanço de escadas	○	○	○
f. Inclinar-se, ajoelhar-se ou baixar-se	○	○	○
g. Andar **mais de 1 km**	○	○	○
h. Andar **vários** quarteirões ou grupos de casas	○	○	○
i. Andar **um** quarteirão ou grupos de casas	○	○	○
j. Tomar banho ou vestir-se sozinho/a	○	○	○

4. Durante as últimas 4 semanas teve, no seu trabalho ou actividades diárias, algum dos problemas apresentados a seguir como consequência do seu estado de saúde físico?

Por favor, em cada linha, preencha a 1ª opção se a resposta for Sim e a 2ª opção se a resposta for Não

	Sim	Não
a. Diminuiu o **tempo gasto** a trabalhar ou em outras actividades	○	○
b. Fez **menos** do que queria?	○	○
c. Sentiu-se limitado/a no **tipo** de trabalho ou em outras actividades	○	○
d. Teve **dificuldade** em executar o seu trabalho ou outras actividades diárias (por exemplo, foi preciso esforçar-se mais)	○	○

5. Durante as últimas 4 semanas, teve com o seu trabalho ou com as suas actividades diárias, algum dos problemas apresentados a seguir devido a quaisquer problemas emocionais (tal como sentir-se deprimido/a ou ansioso/a)?

Por favor, em cada linha, preencha a 1ª opção se a resposta for Sim e a 2ª opção se a resposta for Não

	Sim	Não
a. Diminui o **tempo gasto** a trabalhar ou em outras actividades	○	○
b. Fez **menos** do que queria?	○	○
c. Não executou o trabalho ou outras actividades **tão cuidadosamente** como era costume	○	○

6. Durante as 4 últimas semanas, em que medida é que a sua saúde física ou problemas emocionais interferiram no seu relacionamento social normal com a família, amigos, vizinhos ou outras pessoas?

Absolutamente nada	Pouco	Moderadamente	Bastante	Imenso
○	○	○	○	○

7. Durante as últimas 4 semanas teve dores?

Nenhumas	Muito fracas	Ligeiras	Moderadas	Fortes	Muito fortes
○	○	○	○	○	○

8. Durante as últimas 4 semanas, de que forma é que a dor interferiu com o seu trabalho normal (tanto o trabalho fora de casa como o trabalho doméstico)?

Absolutamente nada	Pouco	Moderadamente	Bastante	Imenso
○	○	○	○	○

9. A s perguntas que se seguem pretendem avaliar a forma como se sentiu e como lhe correram as coisas nas últimas 4 semanas.
Para cada pergunta, preencha por favor o círculo que melhor descreve a forma como se sentiu.
Certifique-se que preenche um círculo em cada linha.

*Quanto tempo, nas últimas **quatro semanas**...*	Sempre	A maior parte do tempo	Bastante tempo	Algum tempo	Pouco tempo	Nunca
a. Se sentiu cheio/a de vitalidade?	○	○	○	○	○	○
b. Se sentiu muito nervoso/a?	○	○	○	○	○	○
c. Se sentiu tão deprimido/a que nada o/a animava?	○	○	○	○	○	○
d. Se sentiu calmo/a e tranquilo/a?	○	○	○	○	○	○
e. Se sentiu com muita energia?	○	○	○	○	○	○
f. Se sentiu triste e em baixo?	○	○	○	○	○	○
g. Se sentiu estafado/a?	○	○	○	○	○	○
h. Se sentiu feliz?	○	○	○	○	○	○
i. Se sentiu cansado/a?	○	○	○	○	○	○

10. Durante as últimas 4 semanas, até que ponto é que a sua saúde física ou problemas emocionais limitaram a sua actividade social (tal como visitar amigos ou familiares próximos)?

Sempre	A maior parte do tempo	Algum tempo	Pouco tempo	Nunca
○	○	○	○	○

11. Por favor, diga em que medida são verdadeiras ou falsas as seguintes afirmações.
Preencha um círculo para cada linha.

	Absolutamente verdade	Verdade	Não sei	Falso	Absolutamente falso
a. Pareço que adoeço mais facilmente do que outros	○	○	○	○	○
b. Sou tão saudável como qualquer outra pessoa	○	○	○	○	○
c. Estou convencido/a que a minha saúde vai piorar	○	○	○	○	○
d. A minha saúde é óptima	○	○	○	○	○

Muito obrigado pela sua colaboração!

B. DESCRIPTIVE STATISTICS SPSS OUTPUT

GENDER (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Feminino	1048	62,3	62,3	62,3
	Masculino	634	37,7	37,7	100,0
	Total	1682	100,0	100,0	

RACE (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasiana	1276	75,9	99,5	99,5
	Outra	6	,4	,5	100,0
	Total	1282	76,2	100,0	
Missing	System	400	23,8		
Total		1682	100,0		

MARITAL STATUS (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Casado	1185	70,5	70,5	70,5
	Solteiro	221	13,1	13,1	83,6
	Viúvo	169	10,0	10,1	93,7
	Divorciado	106	6,3	6,3	100,0
	Total	1681	99,9	100,0	
Missing	9	1	,1		
Total		1682	100,0		

BMI (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Magro	11	,7	,7	,7
	Normal	600	35,7	36,2	36,8
	Sobrepeso	686	40,8	41,4	78,2
	Obeso	362	21,5	21,8	100,0
	Total	1659	98,6	100,0	
Missing	System	23	1,4		
Total		1682	100,0		

EDUCATION (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	42	2,5	2,5	2,5
	1	6	,4	,4	2,9
	2	26	1,5	1,5	4,4
	3	63	3,7	3,8	8,2
	4	480	28,5	28,6	36,7
	5	36	2,1	2,1	38,9
	6	89	5,3	5,3	44,2
	7	41	2,4	2,4	46,6
	8	37	2,2	2,2	48,8
	9	170	10,1	10,1	59,0

	10	36	2,1	2,1	61,1
	11	83	4,9	4,9	66,1
	12	108	6,4	6,4	72,5
	13	32	1,9	1,9	74,4
	14	47	2,8	2,8	77,2
	15	74	4,4	4,4	81,6
	16	114	6,8	6,8	88,4
	17	188	11,2	11,2	99,6
	18	7	,4	,4	100,0
	Total	1679	99,8	100,0	
Missing	99	3	,2		
Total		1682	100,0		

OCCUPATION (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prof. superiores	262	15,6	15,6	15,6
	Prof. intermédias	174	10,3	10,4	26,0
	Prof. especializadas não manuais	218	13,0	13,0	38,9
	Prof. especializadas manuais	34	2,0	2,0	41,0
	Prof. Semi-qualificadas	119	7,1	7,1	48,0
	Prof. sem qualificação	121	7,2	7,2	55,2
	Outros(reformado, inválido...)	473	28,1	28,2	83,4
	Sem profissão, domésticas	279	16,6	16,6	100,0
	Total	1680	99,9	100,0	
Missing	9	2	,1		
Total		1682	100,0		

PHYSICAL ACTIVITY AT WORK (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	não trabalha	649	38,6	39,3	39,3
	está sentado	468	27,8	28,3	67,6
	em pé e anda	384	22,8	23,2	90,8
	em pé, anda e sobe escadas	135	8,0	8,2	99,0
	trabalhos pesados	17	1,0	1,0	100,0
	Total	1653	98,3	100,0	
Missing	9	7	,4		
	System	22	1,3		
	Total	29	1,7		
Total		1682	100,0		

HOUSEWORK (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não faz trabalhos domésticos	300	17,8	18,1	18,1
	Faz trabalhos domésticos	1355	80,6	81,6	99,7
	9	5	,3	,3	100,0
	Total	1660	98,7	100,0	
Missing	System	22	1,3		
Total		1682	100,0		

TOTAL PHYSICAL ACTIVITY (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	996	59,2	60,5	60,5
	2	613	36,4	37,3	97,8
	3	34	2,0	2,1	99,9
	4	2	,1	,1	100,0
	Total	1645	97,8	100,0	
Missing	System	37	2,2		
Total		1682	100,0		

ALCOOL CONSUMPTION (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	303	18,0	18,3	18,3
	Sim	1351	80,3	81,7	100,0
	Total	1654	98,3	100,0	
Missing	9	6	,4		
	System	22	1,3		
	Total	28	1,7		
Total		1682	100,0		

SMOKING HABITS (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	929	55,2	56,2	56,2
	Sim	725	43,1	43,8	100,0
	Total	1654	98,3	100,0	
Missing	9	6	,4		
	System	22	1,3		
	Total	28	1,7		
Total		1682	100,0		

MEDICAL FACILITIES ATTENDED (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	39	2,3	2,3	2,3
	1	1016	60,4	61,2	63,6
	2	270	16,1	16,3	79,8
	3	87	5,2	5,2	85,1
	4	233	13,9	14,0	99,1
	9	15	,9	,9	100,0
	Total	1660	98,7	100,0	
Missing	System	22	1,3		
Total		1682	100,0		

DISEASES NEEDING MEDICAL CARE (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	650	38,6	38,7	38,7
	Sim	1028	61,1	61,3	100,0
	Total	1678	99,8	100,0	
Missing	9	3	,2		
	System	1	,1		

	Total	4	,2		
Total		1682	100,0		

AGE (GROUPS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Até 35 anos	162	9,6	9,6	9,6
	36 - 55 anos	547	32,5	32,5	42,2
	> 55 anos	973	57,8	57,8	100,0
	Total	1682	100,0	100,0	

GENDER (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Feminino	1047	62,2	62,2	62,2
	Masculino	635	37,8	37,8	100,0
	Total	1682	100,0	100,0	

MARITAL STATUS (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Casado	1134	67,4	67,4	67,4
	Solteiro	192	11,4	11,4	78,8
	Viúvo	232	13,8	13,8	92,6
	Divorciado	124	7,4	7,4	100,0
	Total	1682	100,0	100,0	

RACE (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasiana	1276	75,9	99,5	99,5
	Outra	6	,4	,5	100,0
	Total	1282	76,2	100,0	
Missing	System	400	23,8		
Total		1682	100,0		

BMI (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Magro	19	1,1	1,1	1,1
	Normal	547	32,5	32,7	33,8
	Sobrepeso	694	41,3	41,5	75,3
	Obeso	414	24,6	24,7	100,0
	Total	1674	99,5	100,0	
Missing	System	8	,5		
Total		1682	100,0		

OCCUPATION (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prof. superiores	223	13,3	13,3	13,3
	Prof. intermédias	146	8,7	8,7	22,1
	Prof. especializadas não manuais	167	9,9	10,0	32,0
	Prof. especializadas manuais	11	,7	,7	32,7
	Prof. Semi-qualificadas	75	4,5	4,5	37,2
	Prof. sem qualificação	78	4,6	4,7	41,8
	Outros(reformado, inválido...)	719	42,7	43,0	84,8

	Sem profissão, domésticas	155	9,2	9,3	94,1
	Desempregado	81	4,8	4,8	98,9
	Estudantes	18	1,1	1,1	100,0
	Total	1673	99,5	100,0	
Missing	9	9	,5		
Total		1682	100,0		

PHYSICAL ACTIVITY AT WORK (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	não trabalha	747	44,4	48,8	48,8
	está sentado	364	21,6	23,8	72,6
	em pé e anda	304	18,1	19,9	92,4
	em pé, anda e sobe escadas	96	5,7	6,3	98,7
	trabalhos pesados	20	1,2	1,3	100,0
	Total	1531	91,0	100,0	
Missing	9	150	8,9		
	System	1	,1		
	Total	151	9,0		
Total		1682	100,0		

HOUSEWORK (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não faz trabalhos domésticos	173	10,3	10,3	10,3
	Faz trabalhos domésticos	1504	89,4	89,7	100,0
	Total	1677	99,7	100,0	
Missing	9	4	,2		
	System	1	,1		
	Total	5	,3		
Total		1682	100,0		

TOTAL PHYSICAL ACTIVITY (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	852	50,7	62,2	62,2
	2	491	29,2	35,8	98,0
	3	23	1,4	1,7	99,7
	4	4	,2	,3	100,0
	Total	1370	81,5	100,0	
Missing	System	312	18,5		
Total		1682	100,0		

ALCOOL CONSUMPTION (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	262	15,6	15,7	15,7
	Sim	1403	83,4	84,3	100,0
	Total	1665	99,0	100,0	
Missing	9	16	1,0		
	System	1	,1		
	Total	17	1,0		
Total		1682	100,0		

SMOKING HABITS (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	931	55,4	55,5	55,5
	Sim	747	44,4	44,5	100,0
	Total	1678	99,8	100,0	
Missing	9	3	,2		
	System	1	,1		
	Total	4	,2		
Total		1682	100,0		

SLEEPING HOURS (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	4	,2	,2	,2
	4	13	,8	,8	1,0
	5	53	3,2	3,2	4,2
	6	270	16,1	16,2	20,4
	7	393	23,4	23,5	43,9
	8	627	37,3	37,5	81,4
	9	153	9,1	9,2	90,6
	10	97	5,8	5,8	96,4
	11	27	1,6	1,6	98,0
	12	25	1,5	1,5	99,5
	13	5	,3	,3	99,8
	14	3	,2	,2	100,0
	Total	1670	99,3	100,0	
Missing	System	12	,7		
Total		1682	100,0		

MEDICAL FACILITIES ATTENDED (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1012	60,2	60,3	60,3
	2	317	18,8	18,9	79,2
	3	106	6,3	6,3	85,5
	4	243	14,4	14,5	100,0
	Total	1678	99,8	100,0	
Missing	9	4	,2		
Total		1682	100,0		

DISEASES NEEDING MEDICAL CARE (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Não	534	31,7	32,1	32,1
	Sim	1129	67,1	67,9	100,0
	Total	1663	98,9	100,0	
Missing	9	19	1,1		
Total		1682	100,0		

AGE CATEGORIES OF 5 YEARS (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 26 anos	71	4,2	4,2	4,2
	26 - 30 anos	80	4,8	4,8	9,0

	31 - 35 anos	76	4,5	4,5	13,5
	36 - 40 anos	115	6,8	6,8	20,3
	41 - 45 anos	185	11,0	11,0	31,3
	46 - 50 anos	216	12,8	12,8	44,2
	51 - 55 anos	211	12,5	12,5	56,7
	56 - 60 anos	208	12,4	12,4	69,1
	61 - 65 anos	177	10,5	10,5	79,6
	66 - 70 anos	157	9,3	9,3	88,9
	> 70 anos	186	11,1	11,1	100,0
	Total	1682	100,0	100,0	

AGE CATEGORIES OF 5 YEARS (2nd Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 30 anos	48	2,9	2,9	2,9
	31 - 35 anos	73	4,3	4,4	7,4
	36 - 40 anos	79	4,7	4,8	12,2
	41 - 45 anos	122	7,3	7,4	19,6
	46 - 50 anos	141	8,4	8,6	28,2
	51 - 55 anos	205	12,2	12,5	40,7
	> 56 anos	973	57,8	59,3	100,0
	Total	1641	97,6	100,0	
Missing	System	41	2,4		
Total		1682	100,0		

AGE CATEGORIES OF 10 YEARS (1st Evaluation)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 30	89	5,3	5,3	5,3
	31 - 40	152	9,0	9,0	14,3
	41 - 50	263	15,6	15,6	30,0
	51 - 60	433	25,7	25,7	55,7
	61 - 70	384	22,8	22,8	78,5
	71 - 80	303	18,0	18,0	96,6
	> 80 anos	58	3,4	3,4	100,0
	Total	1682	100,0	100,0	

Descriptives for remaining variables

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
IDADE_BL	1682	18	86	52,32	14,351
ESCOLARIDADE_BL	1679	0	18	8,87	5,164
Horas semanais de trabalho	1608	0	60	22,23	20,450
Total actividades fisicas	1645	1	4	1,42	,540
gr/dia	1554	0	284	20,85	32,707
CIGARROS_BL	1650	0	80	8,05	12,755
Sono horas/dia	1654	4	15	7,79	1,513
Percepção da saúde	1059	5	97	59,79	19,025
Idade_2_avaliacao	1682	20	93	57,44	14,771
Horas semanais de trabalho	755	1	60	38,73	11,357
CIG_F20	696	1	80	18,75	12,582
Sono horas/dia	1670	3	14	7,64	1,441
ALCOHOLCD_F20	1605	0	129	13,24	19,981
PERC_F20	1276	5	97	59,35	19,164

C. INFERENTIAL STATISTICS: STUDENT´S T-DISTRIBUTION SPSS OUTPUT

C1. **Completed years of Schooling Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ESCOLARIDADE_BL	8,87	1676	5,160	,126
	ESCOL_F20	9,03	1676	5,264	,129

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ESCOLARIDADE_BL & ESCOL_F20	1676	,950	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval
					Lower
Pair 1	ESCOLARIDADE_BL - ESCOL_F20	-,165	1,650	,040	-,244

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Conf. Interval			
		Upper			
Pair 1	ESCOLARIDADE_BL - ESCOL_F20	-,086	-4,086	1675	,000

C2. **Working Hours Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Horas semanais de trabalho	22,98	1447	20,416	,537
	Horas semanais de trabalho	19,49	1447	20,822	,547

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Horas semanais de trabalho & Horas semanais de trabalho	1447	,653	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval
					Lower
Pair 1	Horas semanais de trabalho - Horas semanais de trabalho	3,484	17,179	,452	2,599

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Confidence Interval Upper			
Pair 1	Horas semanais de trabalho - Horas semanais de trabalho	4,370	7,716	1446	,000

C3. **Alcohol Intake Amount Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	gr/dia	20,73	1484	32,556	,845
	ALCOHOLCD_F20	13,11	1484	19,991	,519

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	gr/dia & ALCOHOLCD_F20	1484	,615	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval Lower
Pair 1	gr/dia - ALCOHOLCD_F20	7,623	25,668	,666	6,316

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Confidence Interval Upper			
Pair 1	gr/dia - ALCOHOLCD_F20	8,930	11,440	1483	,000

C4. **Cigarette consumption Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	CIGARROS_BL	18,48	690	13,648	,520
	CIG_F20	18,74	690	12,625	,481

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	CIGARROS_BL & CIG_F20	690	,719	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval
					Lower
Pair 1	CIGARROS_BL - CIG_F20	-,261	9,888	,376	-1,000

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Confidence Interval			
		Upper			
Pair 1	CIGARROS_BL - CIG_F20	,478	-,693	689	,489

C5. **Sleeping hours Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Sono horas/dia	7,78	1645	1,500	,037
	Sono horas/dia	7,62	1645	1,422	,035

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Sono horas/dia & Sono horas/dia	1645	,347	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval
					Lower
Pair 1	Sono horas/dia - Sono h/dia	,157	1,670	,041	,077

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Confidence Interval			
		Upper			
Pair 1	Sono horas/dia - Sono horas/dia	,238	3,823	1644	,000

C6. **Total Physical Activity Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Total actividades físicas	1557,064	1347	329,5845	8,9801
	Total actividades físicas	1537,023	1347	313,0720	8,5302

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Total actividades fisicas & Total actividades fisicas	1347	,532	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Confidence Interval
					Lower
Pair 1	Total actividades fisicas - Total actividades fisicas	20,0408	311,1825	8,4787	3,4078

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Confidence Interval			
		Upper			
Pair 1	Total actividades fisicas - Total actividades físicas	36,6738	2,364	1346	,018

C7. **Heath Perception Correlations and Test**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Perceção da saúde	60,79	869	18,501	,628
	PERC_F20	61,00	869	18,587	,631

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Percepção da saúde & PERC_F20	869	,656	,000

Paired Samples Test

		Paired Differences			
		Mean	Std. Deviation	Std. Error Mean	95 % Conf. Inter
					Lower
Pair 1	Percepção da saúde - PERC_F20	-,207	15,387	,522	-1,232

Paired Samples Test

		Paired Differences	t	df	Sig. (2-tailed)
		95 % Conf. Interv			
		Upper			
Pair 1	Percepção da saúde - PERC_F20	,817	-,397	868	,692

D. INFERENTIAL STATISTICS: MULTIPLE LINEAR REGRESSION SPSS OUTPUT

D1. Regression for Full sample from the 1st Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	IDADE_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Prof_sup_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Percepção da saúde

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,165[a]	,027	,026	19,2187	
2	,214[b]	,046	,044	19,0472	
3	,224[c]	,050	,047	19,0140	1,987

a. Predictors: (Constant), IDADE_BL
b. Predictors: (Constant), IDADE_BL, Sono horas/dia
c. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1
d. Dependent Variable: Percepção da saúde

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9982,295	1	9982,295	27,026	,000[b]
	Residual	354583,149	960	369,357		
	Total	364565,444	961			
2	Regression	16642,650	2	8321,325	22,937	,000[c]
	Residual	347922,794	959	362,797		
	Total	364565,444	961			
3	Regression	18216,583	3	6072,194	16,796	,000[d]
	Residual	346348,861	958	361,533		
	Total	364565,444	961			

a. Dependent Variable: Percepção da saúde
b. Predictors: (Constant), IDADE_BL
c. Predictors: (Constant), IDADE_BL, Sono horas/dia
d. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	71,702	2,256		31,787	,000
	IDADE_BL	-,217	,042	-,165	-5,199	,000
2	(Constant)	85,584	3,936		21,742	,000
	IDADE_BL	-,209	,041	-,159	-5,038	,000
	Sono horas/dia	-1,838	,429	-,135	-4,285	,000
3	(Constant)	83,840	4,017		20,869	,000
	IDADE_BL	-,185	,043	-,141	-4,326	,000
	Sono horas/dia	-1,843	,428	-,136	-4,304	,000
	Prof_sup_1	3,653	1,751	,068	2,087	,037

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	IDADE_BL	1,000	1,000
2	(Constant)		
	IDADE_BL	,998	1,002
	Sono horas/dia	,998	1,002
3	(Constant)		
	IDADE_BL	,930	1,076
	Sono horas/dia	,998	1,002
	Prof_sup_1	,932	1,073

a. Dependent Variable: Percepção da saúde

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_1	-,005[b]	-,160	,873	-,005	,998
	Casado_1	-,007[b]	-,202	,840	-,007	,974
	Solteiro_1	,008[b]	,222	,824	,007	,768
	Viuvo_1	,042[b]	1,260	,208	,041	,921
	Normal_1	,017[b]	,500	,617	,016	,919
	Sobrepeso_1	,017[b]	,513	,608	,017	,967
	Obeso_1	-,045[b]	-1,413	,158	-,046	,980
	ESCOLARIDADE_BL	,024[b]	,662	,508	,021	,780
	Prof_sup_1	,067[b]	2,043	,041	,066	,932
	Prof_Int_1	-,005[b]	-,153	,878	-,005	,982
	Prof_Esp_nao_manuais_1	-,001[b]	-,042	,966	-,001	,976
	Prof_Esp_manuais_1	-,035[b]	-1,095	,274	-,035	,997
	Prof_Semiqualificadas_1	-,031[b]	-,968	,334	-,031	,994
	Prof_Sem_qualificacao_1	-,057[b]	-1,800	,072	-,058	,996
	Horas semanais de trabalho	,013[b]	,343	,732	,011	,752
	ACTIVIDADE_FISICA_BL	-,003[b]	-,100	,920	-,003	,827
	DOMESTICOS_BL	,000[b]	-,003	,998	,000	1,000
	Total actividades físicas	,037[b]	1,167	,243	,038	1,000
	gr/dia	,051[b]	1,598	,110	,052	,997
	ALCOOL_BL	,026[b]	,800	,424	,026	,976
	TABAGISMO_BL	,023[b]	,721	,471	,023	,978
	CIGARROS_BL	-,016[b]	-,505	,614	-,016	,998
	Sono horas/dia	-,135[b]	-4,285	,000	-,137	,998
	DOENÇA_BL	-,044[b]	-1,291	,197	-,042	,890
	Centro_saude	,008[b]	,254	,800	,008	,997
	Consultorio_particular	,001[b]	,037	,970	,001	,991
	Consultorio_hospitalar	,031[b]	,961	,337	,031	,993
2	Masculino_1	-,009[c]	-,274	,784	-,009	,998
	Casado_1	-,009[c]	-,280	,780	-,009	,973
	Solteiro_1	,010[c]	,275	,784	,009	,768
	Viuvo_1	,039[c]	1,189	,235	,038	,920
	Normal_1	,017[c]	,503	,615	,016	,919
	Sobrepeso_1	,019[c]	,598	,550	,019	,967

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_1	1,002[b]	,998
	Casado_1	1,027[b]	,974
	Solteiro_1	1,302[b]	,768
	Viuvo_1	1,086[b]	,921
	Normal_1	1,088[b]	,919
	Sobrepeso_1	1,034[b]	,967
	Obeso_1	1,020[b]	,980
	ESCOLARIDADE_BL	1,281[b]	,780
	Prof_sup_1	1,073[b]	,932
	Prof_Int_1	1,018[b]	,982
	Prof_Esp_nao_manuais_1	1,025[b]	,976
	Prof_Esp_manuais_1	1,003[b]	,997
	Prof_Semiqualificadas_1	1,006[b]	,994
	Prof_Sem_qualificacao_1	1,004[b]	,996
	Horas semanais de trabalho	1,330[b]	,752
	ACTIVIDADE_FISICA_BL	1,210[b]	,827
	DOMESTICOS_BL	1,000[b]	1,000
	Total actividades físicas	1,000[b]	1,000
	gr/dia	1,003[b]	,997
	ALCOOL_BL	1,025[b]	,976
	TABAGISMO_BL	1,022[b]	,978
	CIGARROS_BL	1,002[b]	,998
	Sono horas/dia	1,002[b]	,998
	DOENÇA_BL	1,124[b]	,890
	Centro_saude	1,003[b]	,997
	Consultorio_particular	1,009[b]	,991
	Consultorio_hospitalar	1,007[b]	,993
2	Masculino_1	1,002[c]	,996
	Casado_1	1,028[c]	,971
	Solteiro_1	1,302[c]	,766
	Viuvo_1	1,087[c]	,918
	Normal_1	1,088[c]	,918
	Sobrepeso_1	1,034[c]	,966

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Obeso_1	-,048[b]	-1,515	,130	-,049	,980
	ESCOLARIDADE_BL	,023[b]	,636	,525	,021	,780
	Prof_sup_1	,068[b]	2,087	,037	,067	,932
	Prof_Int_1	-,003[b]	-,088	,930	-,003	,982
	Prof_Esp_nao_manuais_1	,005[b]	,144	,885	,005	,974
	Prof_Esp_manuais_1	-,035[b]	-1,115	,265	-,036	,997
	Prof_Semiqualificadas_1	-,031[b]	-,973	,331	-,031	,994
	Prof_Sem_qualificacao_1	-,055[b]	-1,739	,082	-,056	,996
	Horas semanais de trabalho	,018[b]	,485	,628	,016	,751

	ACTIVIDADE_FISICA_BL	-,001[b]	-,028	,978	-,001	,826
	DOMESTICOS_BL	-,003[b]	-,100	,920	-,003	,999
	Total actividades físicas	,009[b]	,280	,780	,009	,955
	gr/dia	,050[b]	1,582	,114	,051	,997
	ALCOOL_BL	,032[b]	1,000	,317	,032	,974
	TABAGISMO_BL	,022[b]	,684	,494	,022	,978
	CIGARROS_BL	-,015[b]	-,465	,642	-,015	,998
	DOENÇA_BL	-,053[b]	-1,586	,113	-,051	,886
	Centro_saude	,005[b]	,163	,871	,005	,996
	Consultorio_particular	,008[b]	,256	,798	,008	,988
	Consultorio_hospitalar	,029[b]	,915	,361	,030	,993
3	Masculino_1	-,008[b]	-,267	,790	-,009	,998
	Casado_1	-,012[b]	-,372	,710	-,012	,971
	Solteiro_1	,014[b]	,384	,701	,012	,766
	Viuvo_1	,042[b]	1,289	,198	,042	,918
	Normal_1	,013[b]	,404	,686	,013	,917
	Sobrepeso_1	,018[b]	,553	,581	,018	,967
	Obeso_1	-,042[b]	-1,331	,184	-,043	,972
	ESCOLARIDADE_BL	-,022[c]	-,522	,602	-,017	,570
	Prof_Int_1	,010[c]	,323	,746	,010	,945
	Prof_Esp_nao_manuais_1	,020[c]	,600	,549	,019	,930
	Prof_Esp_manuais_1	-,030[c]	-,955	,340	-,031	,990
	Prof_Semiqualificadas_1	-,022[c]	-,685	,493	-,022	,974

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Obeso_1	1,020[b]	,978
	ESCOLARIDADE_BL	1,282[b]	,779
	Prof_sup_1	1,073[b]	,930
	Prof_Int_1	1,019[b]	,980
	Prof_Esp_nao_manuais_1	1,027[b]	,973
	Prof_Esp_manuais_1	1,003[b]	,994
	Prof_Semiqualificadas_1	1,006[b]	,992
	Prof_Sem_qualificacao_1	1,004[b]	,994
	Horas semanais de trabalho	1,332[b]	,749
	ACTIVIDADE_FISICA_BL	1,210[b]	,824
	DOMESTICOS_BL	1,001[b]	,997
	Total actividades fisicas	1,047[b]	,953
	gr/dia	1,003[b]	,995
	ALCOOL_BL	1,027[b]	,974
	TABAGISMO_BL	1,022[b]	,976
	CIGARROS_BL	1,002[b]	,996
	DOENÇA_BL	1,129[b]	,886
	Centro_saude	1,004[b]	,994
	Consultorio_particular	1,012[b]	,988
	Consultorio_hospitalar	1,007[b]	,991
3	Masculino_1	1,002[b]	,928
	Casado_1	1,029[b]	,903
	Solteiro_1	1,306[b]	,717
	Viuvo_1	1,089[b]	,865
	Normal_1	1,090[b]	,865
	Sobrepeso_1	1,035[b]	,900

	Obeso_1	1,029[b]	,918
	ESCOLARIDADE_BL	1,754[c]	,570
	Prof_Int_1	1,059[c]	,897
	Prof_Esp_nao_manuais_1	1,075[c]	,889
	Prof_Esp_manuais_1	1,010[c]	,924
	Prof_Semiqualificadas_1	1,027[c]	,913

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
3	Prof_Sem_qualificacao_1	-,047[b]	-1,492	,136	-,048	,981
	Horas semanais de trabalho	,001[b]	,015	,988	,000	,713
	ACTIVIDADE_FISICA_BL	-,010[b]	-,277	,781	-,009	,815
	DOMESTICOS_BL	-,001[b]	-,044	,965	-,001	,999
	Total actividades fisicas	,010[b]	,300	,764	,010	,955
	gr/dia	,050[b]	1,586	,113	,051	,997
	ALCOOL_BL	,030[b]	,954	,340	,031	,974
	TABAGISMO_BL	,016[b]	,510	,610	,016	,971
	CIGARROS_BL	-,017[b]	-,554	,580	-,018	,996
	DOENÇA_BL	-,050[b]	-1,497	,135	-,048	,884
	Centro_saude	,020[b]	,624	,533	,020	,951
	Consultorio_particular	-,006[b]	-,174	,862	-,006	,947
	Consultorio_hospitalar	,026[b]	,835	,404	,027	,991

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
3	Prof_Sem_qualificacao_1	1,020[b]	,917
	Horas semanais de trabalho	1,403[b]	,713
	ACTIVIDADE_FISICA_BL	1,228[b]	,793
	DOMESTICOS_BL	1,001[b]	,930
	Total actividades fisicas	1,047[b]	,930
	gr/dia	1,003[b]	,927
	ALCOOL_BL	1,027[b]	,908
	TABAGISMO_BL	1,030[b]	,916
	CIGARROS_BL	1,004[b]	,929
	DOENÇA_BL	1,131[b]	,837
	Centro_saude	1,052[b]	,889
	Consultorio_particular	1,056[b]	,893
	Consultorio_hospitalar	1,009[b]	,922

a. Dependent Variable: Percepção da saúde
b. Predictors in the Model: (Constant), IDADE_BL
c. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia
d. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	IDADE_BL	Sono horas/dia
1	1	1,962	1,000	,02	,02	
	2	,038	7,141	,98	,98	

2	1	2,929	1,000	,00	,01	,00
	2	,056	7,213	,03	,86	,17
	3	,015	13,994	,97	,13	,83
3	1	3,118	1,000	,00	,01	,00
	2	,815	1,956	,00	,00	,00
	3	,052	7,733	,03	,83	,20
	4	,015	14,598	,97	,16	,80

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions
		Prof_sup_1
1	1	
	2	
2	1	
	2	
	3	
3	1	,02
	2	,88
	3	,08
	4	,02

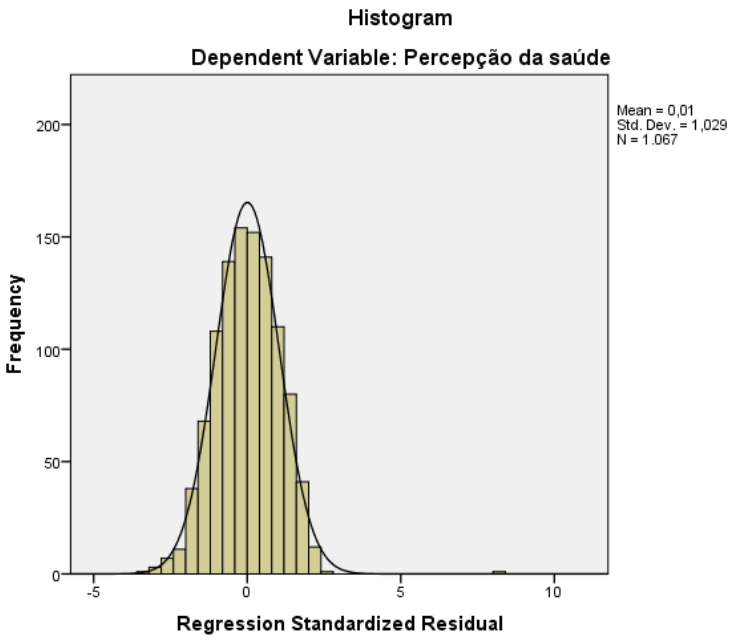
a. Dependent Variable: Percepção da saúde

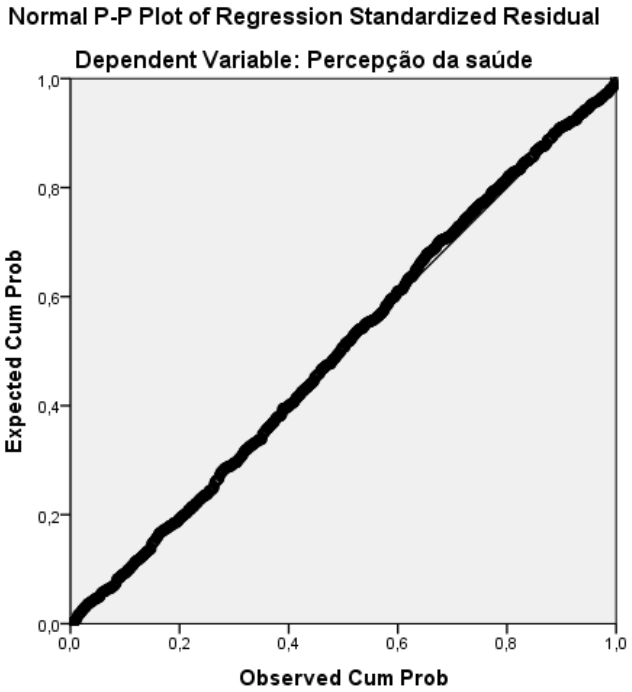
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-112,312	72,908	60,319	6,8800	1067
Residual	-62,2227	152,3118	,1143	19,5691	1067
Std. Predicted Value	-39,675	2,867	-,025	1,580	1067
Std. Residual	-3,272	8,010	,006	1,029	1067

a. Dependent Variable: Percepção da saúde

Charts





D2. Regression for < 36 years sample, from the 1st Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Prof_Esp_nao_manuais_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	DOENÇA_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Percepção da saúde

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,230[a]	,053	,047	16,2117	
2	,300[b]	,090	,078	15,9449	1,825

a. Predictors: (Constant), Prof_Esp_nao_manuais_1
b. Predictors: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL
c. Dependent Variable: Percepção da saúde

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2134,526	1	2134,526	8,122	,005[b]
	Residual	38109,016	145	262,821		
	Total	40243,542	146			
2	Regression	3633,040	2	1816,520	7,145	,001[c]
	Residual	36610,501	144	254,240		
	Total	40243,542	146			

a. Dependent Variable: Percepção da saúde
b. Predictors: (Constant), Prof_Esp_nao_manuais_1
c. Predictors: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	68,215	1,439		47,419
	Prof_Esp_nao_manuais_1	-11,115	3,900	-,230	-2,850
2	(Constant)	70,530	1,706		41,336
	Prof_Esp_nao_manuais_1	-10,757	3,839	-,223	-2,802
	DOENÇA_BL	-6,683	2,753	-,193	-2,428

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,000		
	Prof_Esp_nao_manuais_1	,005	1,000	1,000
2	(Constant)	,000		
	Prof_Esp_nao_manuais_1	,006	,999	1,001
	DOENÇA_BL	,016	,999	1,001

a. Dependent Variable: Percepção da saúde

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	IDADE_BL	-,042[b]	-,515	,607	-,043	,985
	Masculino_1	,011[b]	,132	,895	,011	,981
	Casado_1	,006[b]	,071	,944	,006	,997
	Solteiro_1	-,006[b]	-,071	,944	-,006	,997
	Normal_1	-,037[b]	-,452	,652	-,038	,969
	Sobrepeso_1	,068[b]	,817	,415	,068	,959
	Obeso_1	-,034[b]	-,420	,675	-,035	,993
	ESCOLARIDADE_BL	-,034[b]	-,396	,692	-,033	,895
	Prof_sup_1	,101[b]	1,212	,228	,100	,937
	Prof_Int_1	-,040[b]	-,487	,627	-,041	,979
	Prof_Esp_manuais_1	,004[b]	,054	,957	,005	,994
	Prof_Semiqualificadas_1	-,049[b]	-,601	,549	-,050	,991
	Prof_Sem_qualificacao_1	,020[b]	,250	,803	,021	,993
	Horas semanais de trabalho	,118[b]	1,428	,156	,118	,953
	ACTIVIDADE_FISICA_BL	,064[b]	,786	,433	,065	,991
	DOMESTICOS_BL	,048[b]	,587	,558	,049	,994
	Total actividades fisicas	-,018[b]	-,222	,825	-,018	,996
	gr/dia	,045[b]	,548	,585	,046	,992
	ALCOOL_BL	,111[b]	1,377	,171	,114	,997
	TABAGISMO_BL	,088[b]	1,079	,282	,090	,977
	CIGARROS_BL	,006[b]	,074	,941	,006	,970
	Sono horas/dia	-,028[b]	-,345	,731	-,029	,975
	DOENÇA_BL	-,193[b]	-2,428	,016	-,198	,999
	Centro_saude	-,068[b]	-,838	,404	-,070	,982
	Consultorio_particular	,051[b]	,624	,534	,052	,987
	Consultorio_hospitalar	,068[b]	,843	,401	,070	,993

	IDADE_BL	-,014[c]	-,173	,863	-,014	,964
	Masculino_1	-,031[c]	-,375	,708	-,031	,939
	Casado_1	,022[c]	,269	,788	,022	,991
2	Solteiro_1	-,022[c]	-,269	,788	-,022	,991
	Normal_1	-,056[c]	-,691	,490	-,058	,960
	Sobrepeso_1	,094[c]	1,156	,250	,096	,943
	Obeso_1	-,041[c]	-,509	,612	-,043	,991

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	IDADE_BL	1,015[b]	,985
	Masculino_1	1,019[b]	,981
	Casado_1	1,003[b]	,997
	Solteiro_1	1,003[b]	,997
	Normal_1	1,032[b]	,969
	Sobrepeso_1	1,043[b]	,959
	Obeso_1	1,007[b]	,993
	ESCOLARIDADE_BL	1,117[b]	,895
	Prof_sup_1	1,067[b]	,937
	Prof_Int_1	1,021[b]	,979
	Prof_Esp_manuais_1	1,006[b]	,994
	Prof_Semiqualificadas_1	1,009[b]	,991
	Prof_Sem_qualificacao_1	1,007[b]	,993
	Horas semanais de trabalho	1,050[b]	,953
	ACTIVIDADE_FISICA_BL	1,009[b]	,991
	DOMESTICOS_BL	1,006[b]	,994
	Total actividades fisicas	1,004[b]	,996
	gr/dia	1,008[b]	,992
	ALCOOL_BL	1,003[b]	,997
	TABAGISMO_BL	1,023[b]	,977
	CIGARROS_BL	1,031[b]	,970
	Sono horas/dia	1,026[b]	,975
	DOENÇA_BL	1,001[b]	,999
	Centro_saude	1,018[b]	,982
	Consultorio_particular	1,013[b]	,987
	Consultorio_hospitalar	1,007[b]	,993
2	IDADE_BL	1,037[c]	,964
	Masculino_1	1,065[c]	,939
	Casado_1	1,009[c]	,991
	Solteiro_1	1,009[c]	,991
	Normal_1	1,041[c]	,960
	Sobrepeso_1	1,060[c]	,943
	Obeso_1	1,009[c]	,991

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	ESCOLARIDADE_BL	-,024[b]	-,279	,781	-,023	,893
	Prof_sup_1	,104[b]	1,268	,207	,105	,937
	Prof_Int_1	-,057[b]	-,705	,482	-,059	,972

	Prof_Esp_manuais_1	,008[b]	,106	,916	,009	,994
	Prof_Semiqualificadas_1	-,058[b]	-,730	,467	-,061	,989
	Prof_Sem_qualificacao_1	,033[b]	,416	,678	,035	,989
	Horas semanais de trabalho	,085[b]	1,030	,305	,086	,922
	ACTIVIDADE_FISICA_BL	,036[b]	,448	,655	,037	,970
	DOMESTICOS_BL	,057[b]	,714	,477	,060	,992
	Total actividades fisicas	-,029[b]	-,361	,719	-,030	,993
	gr/dia	,022[b]	,268	,789	,022	,978
	ALCOOL_BL	,079[b]	,983	,327	,082	,966
	TABAGISMO_BL	,047[b]	,569	,571	,047	,929
	CIGARROS_BL	-,032[b]	-,388	,699	-,032	,936
	Sono horas/dia	-,014[b]	-,167	,868	-,014	,969
	Centro_saude	-,055[b]	-,683	,496	-,057	,978
	Consultorio_particular	,030[b]	,367	,714	,031	,975
	Consultorio_hospitalar	,082[b]	1,022	,309	,085	,989

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	ESCOLARIDADE_BL	1,120[b]	,893
	Prof_sup_1	1,067[b]	,935
	Prof_Int_1	1,028[b]	,972
	Prof_Esp_manuais_1	1,006[b]	,993
	Prof_Semiqualificadas_1	1,012[b]	,989
	Prof_Sem_qualificacao_1	1,011[b]	,989
	Horas semanais de trabalho	1,084[b]	,922
	ACTIVIDADE_FISICA_BL	1,031[b]	,970
	DOMESTICOS_BL	1,008[b]	,992
	Total actividades fisicas	1,007[b]	,993
	gr/dia	1,023[b]	,978
	ALCOOL_BL	1,035[b]	,966
	TABAGISMO_BL	1,077[b]	,929
	CIGARROS_BL	1,069[b]	,936
	Sono horas/dia	1,032[b]	,969
	Centro_saude	1,023[b]	,978
	Consultorio_particular	1,026[b]	,975
	Consultorio_hospitalar	1,011[b]	,989

a. Dependent Variable: Percepção da saúde
b. Predictors in the Model: (Constant), Prof_Esp_nao_manuais_1
c. Predictors in the Model: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Prof_Esp_nao_manuais_1	DOENÇA_BL
1	1	1,369	1,000	,32	,32	
	2	,631	1,473	,68	,68	
2	1	1,826	1,000	,13	,10	,13
	2	,784	1,526	,03	,82	,18

3	,389	2,166	,84	,08	,69

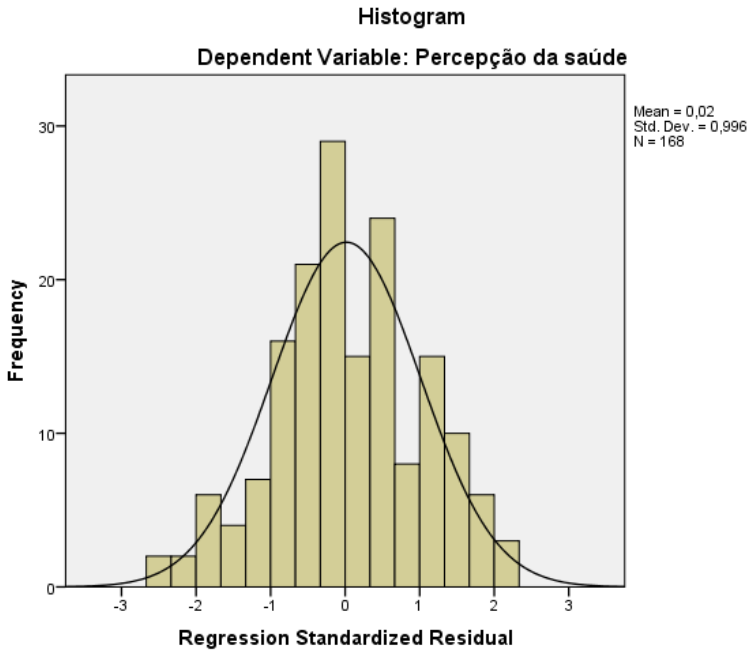
a. Dependent Variable: Percepção da saúde

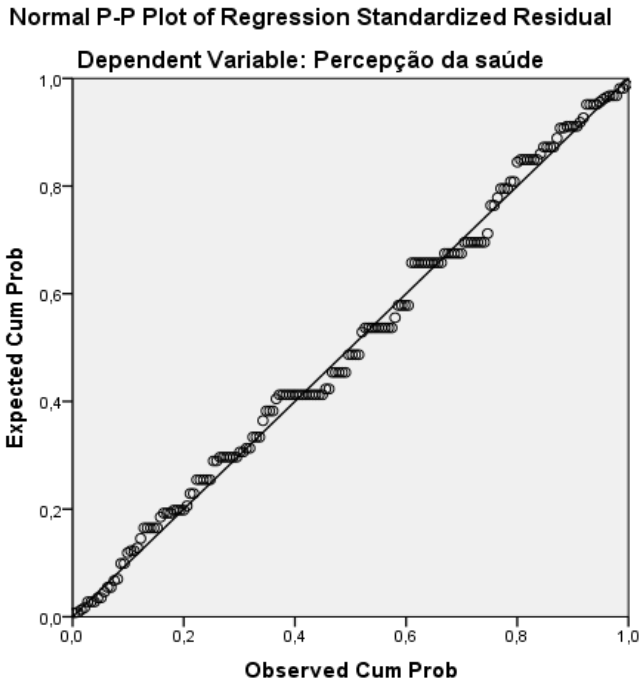
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	53,090	70,530	66,271	5,2974	168
Residual	-38,8472	36,1528	,2560	15,8757	168
Std. Predicted Value	-2,729	,767	-,087	1,062	168
Std. Residual	-2,436	2,267	,016	,996	168

a. Dependent Variable: Percepção da saúde

Charts





D3. Regression for 36 - 55 years sample, from the 1st Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	IDADE_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Percepção da saúde

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,113[a]	,013	,010	19,0057	
2	,161[b]	,026	,021	18,9031	1,993

a. Predictors: (Constant), IDADE_BL
b. Predictors: (Constant), IDADE_BL, Sono horas/dia
c. Dependent Variable: Percepção da saúde

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1876,496	1	1876,496	5,195	,023[b]
	Residual	144486,840	400	361,217		
	Total	146363,336	401			
2	Regression	3789,381	2	1894,691	5,302	,005[c]
	Residual	142573,955	399	357,328		
	Total	146363,336	401			

a. Dependent Variable: Percepção da saúde
b. Predictors: (Constant), IDADE_BL
c. Predictors: (Constant), IDADE_BL, Sono horas/dia

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	80,990	8,548		9,475	,000
	IDADE_BL	-,415	,182	-,113	-2,279	,023
2	(Constant)	92,473	9,844		9,394	,000
	IDADE_BL	-,420	,181	-,115	-2,318	,021
	Sono horas/dia	-1,439	,622	-,114	-2,314	,021

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	IDADE_BL	1,000	1,000
2	(Constant)		
	IDADE_BL	1,000	1,000
	Sono horas/dia	1,000	1,000

a. Dependent Variable: Percepção da saúde

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_1	,025[b]	,510	,610	,026	,998
	Casado_1	-,008[b]	-,153	,878	-,008	1,000
	Solteiro_1	-,010[b]	-,196	,845	-,010	,993
	Viuvo_1	,051[b]	1,034	,302	,052	,997
	Normal_1	-,001[b]	-,017	,987	-,001	,979
	Sobrepeso_1	,043[b]	,872	,384	,044	,997
	Obeso_1	-,055[b]	-1,101	,272	-,055	,990
	ESCOLARIDADE_BL	,016[b]	,313	,755	,016	,950
	Prof_sup_1	,051[b]	1,019	,309	,051	,986
	Prof_Int_1	-,037[b]	-,738	,461	-,037	,998
	Prof_Esp_nao_manuais_1	,077[b]	1,550	,122	,077	1,000
	Prof_Esp_manuais_1	-,079[b]	-1,598	,111	-,080	1,000
	Prof_Semiqualificadas_1	,013[b]	,252	,801	,013	,999
	Prof_Sem_qualificacao_1	-,089[b]	-1,807	,072	-,090	1,000
	Horas semanais de trabalho	,025[b]	,499	,618	,025	,972
	ACTIVIDADE_FISICA_BL	,020[b]	,408	,684	,020	,999
	DOMESTICOS_BL	,002[b]	,041	,967	,002	,999
	Total actividades fisicas	-,042[b]	-,854	,394	-,043	1,000
	gr/dia	,019[b]	,381	,703	,019	,997
	ALCOOL_BL	,076[b]	1,524	,128	,076	,989
	TABAGISMO_BL	,055[b]	1,104	,270	,055	,977
	CIGARROS_BL	,005[b]	,103	,918	,005	,991
	Sono horas/dia	-,114[b]	-2,314	,021	-,115	1,000
	DOENÇA_BL	-,020[b]	-,406	,685	-,020	,975
	Centro_saude	,018[b]	,370	,712	,019	,994
	Consultorio_particular	-,068[b]	-1,362	,174	-,068	1,000
	Consultorio_hospitalar	-,052[b]	-1,050	,294	-,053	,998
2	Masculino_1	,027[c]	,553	,580	,028	,998
	Casado_1	-,009[c]	-,180	,857	-,009	1,000
	Solteiro_1	-,010[c]	-,196	,845	-,010	,993
	Viuvo_1	,047[c]	,954	,341	,048	,995
	Normal_1	,005[c]	,103	,918	,005	,977
	Sobrepeso_1	,045[c]	,913	,362	,046	,997

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_1	1,002[b]	,998
	Casado_1	1,000[b]	1,000
	Solteiro_1	1,008[b]	,993
	Viuvo_1	1,003[b]	,997
	Normal_1	1,021[b]	,979
	Sobrepeso_1	1,003[b]	,997
	Obeso_1	1,011[b]	,990
	ESCOLARIDADE_BL	1,053[b]	,950

	Prof_sup_1	1,015[b]	,986
	Prof_Int_1	1,002[b]	,998
	Prof_Esp_nao_manuais_1	1,000[b]	1,000
	Prof_Esp_manuais_1	1,000[b]	1,000
	Prof_Semiqualificadas_1	1,001[b]	,999
	Prof_Sem_qualificacao_1	1,000[b]	1,000
	Horas semanais de trabalho	1,029[b]	,972
	ACTIVIDADE_FISICA_BL	1,001[b]	,999
	DOMESTICOS_BL	1,001[b]	,999
	Total actividades fisicas	1,000[b]	1,000
	gr/dia	1,003[b]	,997
	ALCOOL_BL	1,011[b]	,989
	TABAGISMO_BL	1,023[b]	,977
	CIGARROS_BL	1,009[b]	,991
	Sono horas/dia	1,000[b]	1,000
	DOENÇA_BL	1,026[b]	,975
	Centro_saude	1,006[b]	,994
	Consultorio_particular	1,000[b]	1,000
	Consultorio_hospitalar	1,002[b]	,998
2	Masculino_1	1,002[c]	,998
	Casado_1	1,000[c]	1,000
	Solteiro_1	1,008[c]	,992
	Viuvo_1	1,005[c]	,995
	Normal_1	1,024[c]	,977
	Sobrepeso_1	1,003[c]	,997

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Obeso_1	-,065[b]	-1,306	,192	-,065	,983
	ESCOLARIDADE_BL	,022[b]	,430	,667	,022	,947
	Prof_sup_1	,054[b]	1,081	,280	,054	,985
	Prof_Int_1	-,038[b]	-,772	,441	-,039	,997
	Prof_Esp_nao_manuais_1	,081[b]	1,637	,102	,082	,999
	Prof_Esp_manuais_1	-,074[b]	-1,504	,133	-,075	,998
	Prof_Semiqualificadas_1	,010[b]	,195	,845	,010	,998
	Prof_Sem_qualificacao_1	-,084[b]	-1,710	,088	-,085	,998
	Horas semanais de trabalho	,029[b]	,577	,564	,029	,971
	ACTIVIDADE_FISICA_BL	,025[b]	,499	,618	,025	,997
	DOMESTICOS_BL	-,002[b]	-,041	,967	-,002	,998
	Total actividades fisicas	-,072[b]	-1,420	,156	-,071	,949
	gr/dia	,023[b]	,461	,645	,023	,996
	ALCOOL_BL	,087[b]	1,744	,082	,087	,981
	TABAGISMO_BL	,062[b]	1,234	,218	,062	,974
	CIGARROS_BL	,015[b]	,309	,758	,015	,983
	DOENÇA_BL	-,031[b]	-,617	,537	-,031	,967
	Centro_saude	,014[b]	,285	,776	,014	,993
	Consultorio_particular	-,062[b]	-1,259	,209	-,063	,998
	Consultorio_hospitalar	-,057[b]	-1,151	,250	-,058	,997

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Obeso_1	1,018[b]	,983
	ESCOLARIDADE_BL	1,056[b]	,947
	Prof_sup_1	1,015[b]	,985
	Prof_Int_1	1,003[b]	,997
	Prof_Esp_nao_manuais_1	1,001[b]	,999
	Prof_Esp_manuais_1	1,002[b]	,998
	Prof_Semiqualificadas_1	1,002[b]	,998
	Prof_Sem_qualificacao_1	1,002[b]	,998
	Horas semanais de trabalho	1,030[b]	,971
	ACTIVIDADE_FISICA_BL	1,003[b]	,997
	DOMESTICOS_BL	1,002[b]	,998
	Total actividades fisicas	1,054[b]	,949
	gr/dia	1,005[b]	,996
	ALCOOL_BL	1,019[b]	,981
	TABAGISMO_BL	1,026[b]	,974
	CIGARROS_BL	1,017[b]	,983
	DOENÇA_BL	1,034[b]	,967
	Centro_saude	1,007[b]	,993
	Consultorio_particular	1,002[b]	,998
	Consultorio_hospitalar	1,003[b]	,997

a. Dependent Variable: Percepção da saúde
b. Predictors in the Model: (Constant), IDADE_BL
c. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	IDADE_BL	Sono horas/dia
1	1	1,994	1,000	,00	,00	
	2	,006	17,980	1,00	1,00	
2	1	2,967	1,000	,00	,00	,00
	2	,027	10,467	,03	,12	,87
	3	,006	23,159	,97	,87	,13

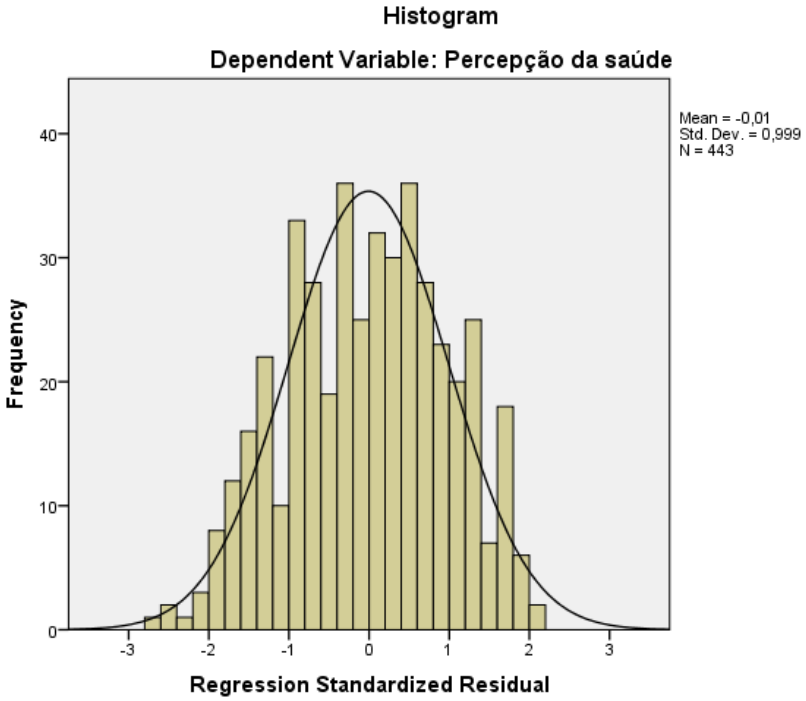
a. Dependent Variable: Percepção da saúde

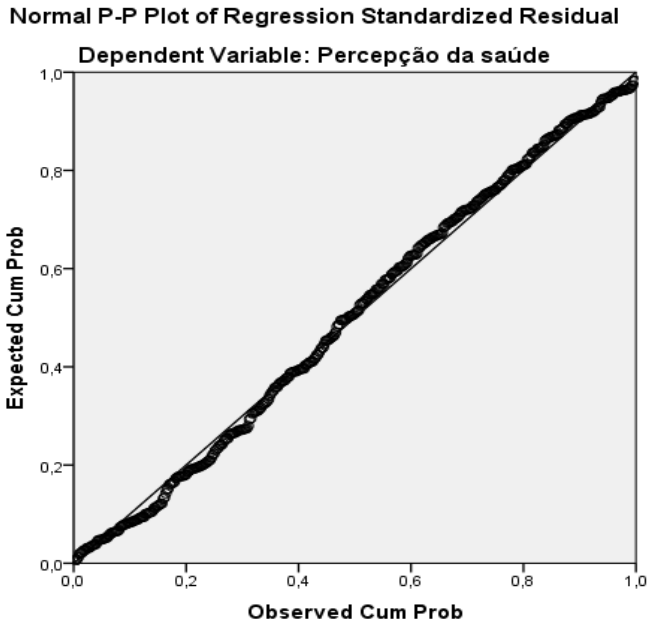
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	51,514	69,026	61,705	3,0829	443
Residual	-51,5416	40,0297	-,1575	18,8934	443
Std. Predicted Value	-3,290	2,407	,025	1,003	443
Std. Residual	-2,727	2,118	-,008	,999	443

a. Dependent Variable: Percepção da saúde

Charts


Histogram
Dependent Variable: Percepção da saúde
Mean = -0,01
Std. Dev. = 0,999
N = 443
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Percepção da saúde
Expected Cum Prob
Observed Cum Prob

D4. Regression for > 55 years sample, from the 1st Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: Percepção da saúde

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,166[a]	,028	,025	19,8646	2,056

a. Predictors: (Constant), Sono horas/dia
b. Dependent Variable: Percepção da saúde

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4619,725	1	4619,725	11,707	,001[b]
	Residual	162182,360	411	394,604		
	Total	166802,085	412			

a. Dependent Variable: Percepção da saúde
b. Predictors: (Constant), Sono horas/dia

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	75,143	5,386		13,953	,000
	Sono horas/dia	-2,306	,674	-,166	-3,422	,001

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Sono horas/dia	1,000	1,000

a. Dependent Variable: Percepção da saúde

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	IDADE_BL	,060[b]	1,235	,218	,061	,996
	Masculino_1	-,046[b]	-,934	,351	-,046	,995
	Casado_1	,005[b]	,100	,920	,005	1,000
	Solteiro_1	,007[b]	,139	,890	,007	,999
	Viuvo_1	,036[b]	,736	,462	,036	1,000
	Normal_1	,016[b]	,324	,746	,016	1,000
	Sobrepeso_1	-,004[b]	-,078	,938	-,004	1,000
	Obeso_1	-,016[b]	-,336	,737	-,017	,999
	ESCOLARIDADE_BL	-,014[b]	-,290	,772	-,014	1,000

	Prof_sup_1	,031[b]	,626	,532	,031	,998
	Prof_Int_1	,055[b]	1,137	,256	,056	,994
	Prof_Esp_nao_manuais_1	-,038[b]	-,785	,433	-,039	1,000
	Prof_Esp_manuais_1	-,012[b]	-,255	,799	-,013	1,000
	Prof_Semiqualificadas_1	-,084[b]	-1,724	,085	-,085	1,000
	Prof_Sem_qualificacao_1	-,046[b]	-,945	,345	-,047	,999
	Horas semanais de trabalho	-,026[b]	-,528	,598	-,026	,998
	ACTIVIDADE_FISICA_BL	-,039[b]	-,805	,421	-,040	,999
	DOMESTICOS_BL	-,019[b]	-,398	,691	-,020	1,000
	Total actividades fisicas	,096[b]	1,948	,052	,096	,969
	gr/dia	,081[b]	1,664	,097	,082	1,000
	ALCOOL_BL	-,023[b]	-,467	,641	-,023	,996
	TABAGISMO_BL	-,041[b]	-,842	,400	-,042	,997
	CIGARROS_BL	-,047[b]	-,967	,334	-,048	,996
	DOENÇA_BL	-,013[b]	-,261	,794	-,013	,992
	Centro_saude	,029[b]	,587	,557	,029	1,000
	Consultorio_particular	,055[b]	1,123	,262	,055	,996
	Consultorio_hospitalar	,070[b]	1,449	,148	,071	1,000

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	IDADE_BL	1,004[b]	,996
	Masculino_1	1,005[b]	,995
	Casado_1	1,000[b]	1,000
	Solteiro_1	1,001[b]	,999
	Viuvo_1	1,000[b]	1,000
	Normal_1	1,000[b]	1,000
	Sobrepeso_1	1,000[b]	1,000
	Obeso_1	1,001[b]	,999
	ESCOLARIDADE_BL	1,000[b]	1,000
	Prof_sup_1	1,002[b]	,998
	Prof_Int_1	1,006[b]	,994
	Prof_Esp_nao_manuais_1	1,000[b]	1,000
	Prof_Esp_manuais_1	1,000[b]	1,000
	Prof_Semiqualificadas_1	1,000[b]	1,000
	Prof_Sem_qualificacao_1	1,001[b]	,999
	Horas semanais de trabalho	1,002[b]	,998
	ACTIVIDADE_FISICA_BL	1,001[b]	,999
	DOMESTICOS_BL	1,000[b]	1,000
	Total actividades fisicas	1,032[b]	,969
	gr/dia	1,000[b]	1,000
	ALCOOL_BL	1,004[b]	,996
	TABAGISMO_BL	1,003[b]	,997
	CIGARROS_BL	1,004[b]	,996
	DOENÇA_BL	1,009[b]	,992
	Centro_saude	1,000[b]	1,000
	Consultorio_particular	1,004[b]	,996
	Consultorio_hospitalar	1,000[b]	1,000

a. Dependent Variable: Percepção da saúde

b. Predictors in the Model: (Constant), Sono horas/dia

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Sono horas/dia
1	1	1,983	1,000	,01	,01
	2	,017	10,928	,99	,99

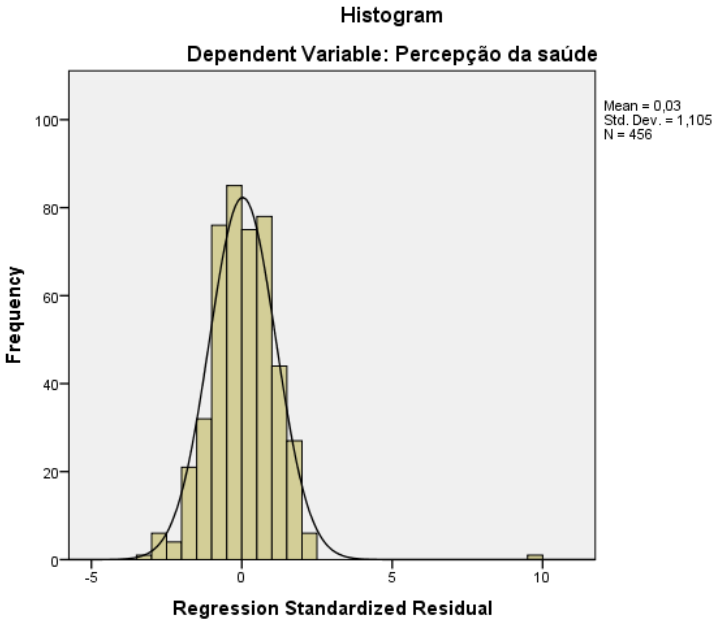
a. Dependent Variable: Percepção da saúde

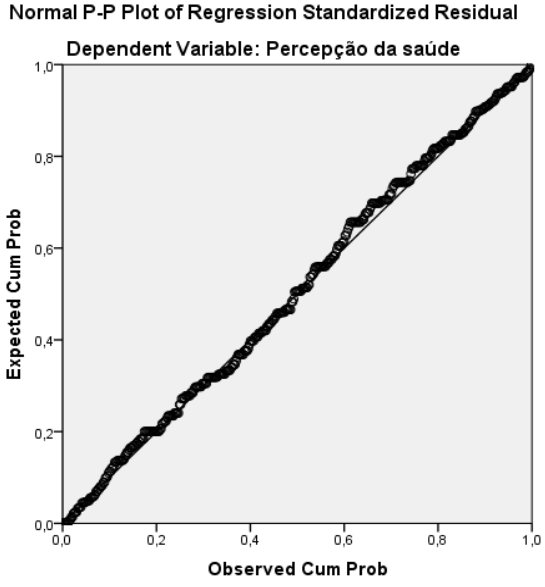
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-155,230	64,766	56,537	10,5024	456
Residual	-62,4601	195,2301	,5689	21,9464	456
Std. Predicted Value	-63,386	2,313	-,145	3,136	456
Std. Residual	-3,144	9,828	,029	1,105	456

a. Dependent Variable: Percepção da saúde

Charts





Tests of Normality for the Models from the 1st Eval. (Dep. Var. - GHP)

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,053	168	,200*	,990	168	,269

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,035	443	,200*	,988	443	,001

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,043	456	,047	,921	456	,000

a. Lilliefors Significance Correction

D5. Regression for Full sample from the 2nd Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Idade_2_avaliacao	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: PERC_F20

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,256[a]	,066	,062	17,45941	1,929

a. Predictors: (Constant), Idade_2_avaliacao
b. Dependent Variable: PERC_F20

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5857,210	1	5857,210	19,215	,000[b]
	Residual	83218,850	273	304,831		
	Total	89076,060	274			

a. Dependent Variable: PERC_F20
b. Predictors: (Constant), Idade_2_avaliacao

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	81,222	4,288		18,943	,000
	Idade_2_avaliacao	-,393	,090	-,256	-4,383	,000

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Idade_2_avaliacao	1,000	1,000

a. Dependent Variable: PERC_F20

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_2	-,067[b]	-1,124	,262	-,068	,962
	Casado_2	-,096[b]	-1,548	,123	-,093	,881
	Solteiro_2	,037[b]	,528	,598	,032	,697
	Viuvo_2	,023[b]	,382	,702	,023	,985
	ESCOL_F20	,001[b]	,022	,982	,001	,951
	Prof_superiores_2	,058[b]	,984	,326	,060	,996
	Prof_intermédias_2	-,055[b]	-,934	,351	-,057	1,000
	Prof_esp_nao_manuais_2	-,019[b]	-,324	,746	-,020	,996
	Prof_semi_qualificadas_2	-,034[b]	-,574	,566	-,035	,998
	Prof_sem_qualificaçao_2	-,038[b]	-,652	,515	-,039	,998
	Alcool_2	,015[b]	,251	,802	,015	,978
	Doença_2	-,091[b]	-1,488	,138	-,090	,915
	Normal_2	-,047[b]	-,784	,434	-,047	,937
	Sobrepeso_2	,028[b]	,468	,640	,028	,929
	Obeso_2	,014[b]	,239	,812	,014	,999
	Horas semanais de trabalho	-,023[b]	-,394	,694	-,024	,980
	DOM_F20	-,056[b]	-,950	,343	-,058	,988
	ALC1_F20	,015[b]	,251	,802	,015	,978
	CIG_F20	-,033[b]	-,550	,583	-,033	,972
	Sono horas/dia	-,086[b]	-1,480	,140	-,089	,999
	Centro_saude_2	,053[b]	,901	,368	,055	,997
	Cons_particular_2	-,059[b]	-1,005	,316	-,061	,998
	Cons_hospitalar_2	,078[b]	1,337	,182	,081	1,000
	ALCOHOLCD_F20	,079[b]	1,356	,176	,082	1,000
	DO_F20	-,091[b]	-1,488	,138	-,090	,915

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_2	1,039[b]	,962
	Casado_2	1,135[b]	,881
	Solteiro_2	1,435[b]	,697
	Viuvo_2	1,016[b]	,985
	ESCOL_F20	1,052[b]	,951
	Prof_superiores_2	1,004[b]	,996
	Prof_intermédias_2	1,000[b]	1,000
	Prof_esp_nao_manuais_2	1,004[b]	,996
	Prof_semi_qualificadas_2	1,002[b]	,998
	Prof_sem_qualificaçao_2	1,002[b]	,998
	Alcool_2	1,023[b]	,978

	Doença_2	1,093[b]	,915
	Normal_2	1,067[b]	,937
	Sobrepeso_2	1,077[b]	,929
	Obeso_2	1,001[b]	,999
	Horas semanais de trabalho	1,020[b]	,980
	DOM_F20	1,012[b]	,988
	ALC1_F20	1,023[b]	,978
	CIG_F20	1,029[b]	,972
	Sono horas/dia	1,001[b]	,999
	Centro_saude_2	1,003[b]	,997
	Cons_particular_2	1,002[b]	,998
	Cons_hospitalar_2	1,000[b]	1,000
	ALCOHOLCD_F20	1,000[b]	1,000
	DO_F20	1,093[b]	,915

a. Dependent Variable: PERC_F20
b. Predictors in the Model: (Constant), Idade_2_avaliacao

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Idade_2_avaliacao
1	1	1,969	1,000	,02	,02
	2	,031	8,020	,98	,98

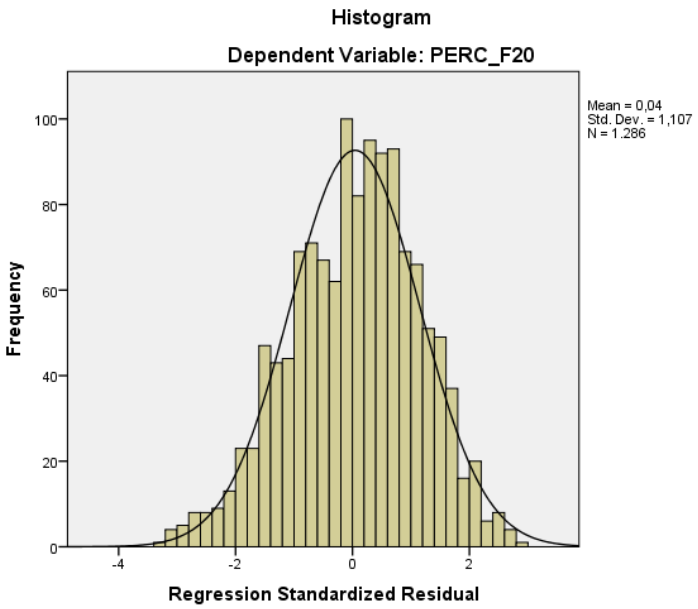
a. Dependent Variable: PERC_F20

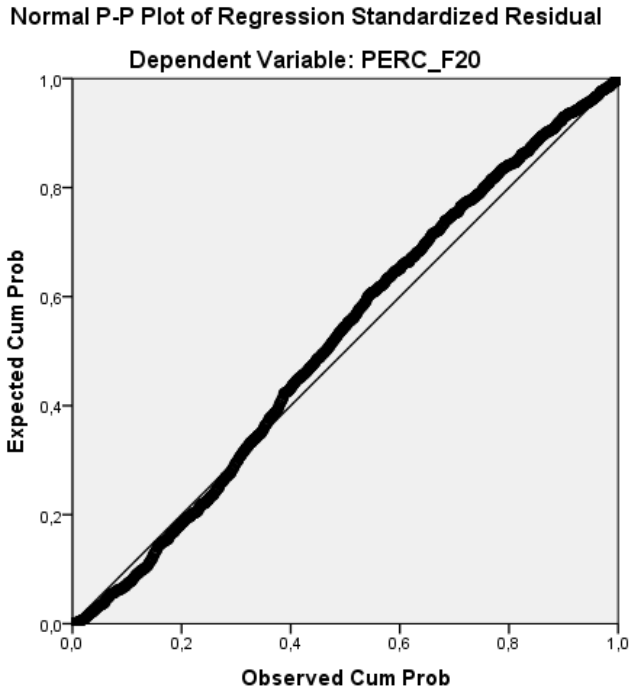
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	44,6962	73,3671	58,9385	5,87547	1286
Residual	-56,19179	51,37624	,74189	19,32808	1286
Std. Predicted Value	-3,959	2,242	-,879	1,271	1286
Std. Residual	-3,218	2,943	,042	1,107	1286

a. Dependent Variable: PERC_F20

Charts





D6. Regression for 36 - 55 years sample, from the 2nd Eval. (Dep. Var. – GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Idade_2_avaliacao	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Casado_2	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
4	Cons_particular_2	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: PERC_F20

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,246[a]	,061	,055	17,30890	
2	,297[b]	,088	,077	17,10613	
3	,347[c]	,121	,104	16,85187	
4	,392[d]	,154	,132	16,58495	1,813

a. Predictors: (Constant), Idade_2_avaliacao
b. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia
c. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2
d. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2, Cons_particular_2
e. Dependent Variable: PERC_F20

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3118,576	1	3118,576	10,409	,002[b]
	Residual	48235,293	161	299,598		
	Total	51353,869	162			
2	Regression	4534,717	2	2267,359	7,748	,001[c]
	Residual	46819,152	160	292,620		
	Total	51353,869	162			
3	Regression	6200,153	3	2066,718	7,278	,000[d]
	Residual	45153,715	159	283,986		
	Total	51353,869	162			
4	Regression	7894,273	4	1973,568	7,175	,000[e]
	Residual	43459,596	158	275,061		
	Total	51353,869	162			

a. Dependent Variable: PERC_F20
b. Predictors: (Constant), Idade_2_avaliacao
c. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia
d. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2
e. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2, Cons_particular_2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	99,152	11,439		8,668	,000
	Idade_2_avaliacao	-,785	,243	-,246	-3,226	,002
2	(Constant)	113,721	13,102		8,680	,000
	Idade_2_avaliacao	-,756	,241	-,238	-3,142	,002
	Sono horas/dia	-2,129	,968	-,166	-2,200	,029
3	(Constant)	123,431	13,516		9,132	,000
	Idade_2_avaliacao	-,811	,238	-,255	-3,405	,001
	Sono horas/dia	-2,316	,956	-,181	-2,422	,017
	Casado_2	-7,554	3,119	-,182	-2,422	,017
4	(Constant)	127,887	13,422		9,528	,000
	Idade_2_avaliacao	-,837	,235	-,263	-3,569	,000
	Sono horas/dia	-2,313	,941	-,181	-2,458	,015
	Casado_2	-9,416	3,160	-,226	-2,979	,003
	Cons_particular_2	-7,852	3,164	-,187	-2,482	,014

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Idade_2_avaliacao	1,000	1,000
2	(Constant)		
	Idade_2_avaliacao	,997	1,003
	Sono horas/dia	,997	1,003
3	(Constant)		
	Idade_2_avaliacao	,988	1,012
	Sono horas/dia	,991	1,009
	Casado_2	,984	1,017
4	(Constant)		
	Idade_2_avaliacao	,986	1,014
	Sono horas/dia	,991	1,009

	Casado_2	,928	1,077
	Cons_particular_2	,943	1,061

a. Dependent Variable: PERC_F20

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_2	-,134[b]	-1,727	,086	-,135	,957
	Casado_2	-,167[b]	-2,200	,029	-,171	,990
	Solteiro_2	,104[b]	1,364	,175	,107	,997
	ESCOL_F20	,041[b]	,540	,590	,043	,995
	Prof_superiores_2	,107[b]	1,399	,164	,110	,994
	Prof_intermédias_2	-,076[b]	-,994	,322	-,078	,999
	Prof_esp_nao_manuais_2	,036[b]	,463	,644	,037	,996
	Prof_semi_qualificadas_2	-,100[b]	-1,307	,193	-,103	,982
	Prof_sem_qualificaçao_2	-,048[b]	-,621	,536	-,049	,994
	Alcool_2	,019[b]	,246	,806	,019	,981
	Doença_2	,011[b]	,141	,888	,011	,992
	Normal_2	-,044[b]	-,564	,574	-,045	,968
	Sobrepeso_2	,080[b]	1,031	,304	,081	,969
	Obeso_2	-,063[b]	-,828	,409	-,065	1,000
	Horas semanais de trabalho	,075[b]	,987	,325	,078	1,000
	DOM_F20	,025[b]	,319	,750	,025	,992
	ALC1_F20	,019[b]	,246	,806	,019	,981
	CIG_F20	,034[b]	,430	,668	,034	,961
	Sono horas/dia	-,166[b]	-2,200	,029	-,171	,997
	Centro_saude_2	,091[b]	1,181	,239	,093	,980
	Cons_particular_2	-,137[b]	-1,807	,073	-,141	1,000
	Cons_hospitalar_2	,086[b]	1,130	,260	,089	,997
	ALCOHOLCD_F20	,042[b]	,545	,587	,043	1,000
	DO_F20	,011[b]	,141	,888	,011	,992
2	Masculino_2	-,136[c]	-1,771	,079	-,139	,957
	Casado_2	-,182[c]	-2,422	,017	-,189	,984
	Solteiro_2	,126[c]	1,669	,097	,131	,982
	ESCOL_F20	,054[c]	,712	,478	,056	,989
	Prof_superiores_2	,099[c]	1,302	,195	,103	,991
	Prof_intermédias_2	-,073[c]	-,971	,333	-,077	,999
	Prof_esp_nao_manuais_2	,053[c]	,694	,488	,055	,986

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_2	1,045[b]	,957
	Casado_2	1,010[b]	,990
	Solteiro_2	1,003[b]	,997
	ESCOL_F20	1,005[b]	,995
	Prof_superiores_2	1,006[b]	,994
	Prof_intermédias_2	1,001[b]	,999
	Prof_esp_nao_manuais_2	1,004[b]	,996
	Prof_semi_qualificadas_2	1,018[b]	,982
	Prof_sem_qualificaçao_2	1,006[b]	,994

	Alcool_2	1,020[b]	,981
	Doença_2	1,008[b]	,992
	Normal_2	1,033[b]	,968
	Sobrepeso_2	1,032[b]	,969
	Obeso_2	1,000[b]	1,000
	Horas semanais de trabalho	1,000[b]	1,000
	DOM_F20	1,008[b]	,992
	ALC1_F20	1,020[b]	,981
	CIG_F20	1,040[b]	,961
	Sono horas/dia	1,003[b]	,997
	Centro_saude_2	1,021[b]	,980
	Cons_particular_2	1,000[b]	1,000
	Cons_hospitalar_2	1,003[b]	,997
	ALCOHOLCD_F20	1,000[b]	1,000
	DO_F20	1,008[b]	,992
	Masculino_2	1,045[c]	,954
	Casado_2	1,017[c]	,984
	Solteiro_2	1,019[c]	,982
2	ESCOL_F20	1,011[c]	,989
	Prof_superiores_2	1,009[c]	,990
	Prof_intermédias_2	1,001[c]	,997
	Prof_esp_nao_manuais_2	1,014[c]	,986

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
	Prof_semi_qualificadas_2	-,102[b]	-1,343	,181	-,106	,982
	Prof_sem_qualificaçao_2	-,056[b]	-,742	,459	-,059	,991
	Alcool_2	,016[b]	,213	,831	,017	,981
	Doença_2	,011[b]	,150	,881	,012	,992
	Normal_2	-,028[b]	-,357	,722	-,028	,959
	Sobrepeso_2	,072[b]	,938	,350	,074	,967
	Obeso_2	-,079[b]	-1,045	,297	-,083	,991
2	Horas semanais de trabalho	,081[b]	1,070	,286	,085	,999
	DOM_F20	,018[b]	,238	,812	,019	,990
	ALC1_F20	,016[b]	,213	,831	,017	,981
	CIG_F20	,013[b]	,168	,867	,013	,947
	Centro_saude_2	,100[b]	1,308	,193	,103	,977
	Cons_particular_2	-,134[b]	-1,783	,076	-,140	,999
	Cons_hospitalar_2	,100[b]	1,320	,189	,104	,991
	ALCOHOLCD_F20	,018[b]	,238	,812	,019	,979
	DO_F20	,011[b]	,150	,881	,012	,992
	Masculino_2	-,107[b]	-1,384	,168	-,109	,927
	Solteiro_2	,042[b]	,472	,638	,038	,706
	ESCOL_F20	,009[b]	,119	,905	,009	,927
	Prof_superiores_2	,073[b]	,968	,334	,077	,969
3	Prof_intermédias_2	-,070[b]	-,942	,348	-,075	,999
	Prof_esp_nao_manuais_2	,067[b]	,897	,371	,071	,980
	Prof_semi_qualificadas_2	-,091[b]	-1,215	,226	-,096	,979
	Prof_sem_qualificaçao_2	-,057[b]	-,768	,444	-,061	,991
	Alcool_2	,031[c]	,409	,683	,033	,974

	Doença_2	,017[c]	,224	,823	,018	,991
	Normal_2	-,070[c]	-,900	,369	-,071	,915
	Sobrepeso_2	,097[c]	1,269	,206	,100	,952
	Obeso_2	-,051[c]	-,679	,498	-,054	,966
	Horas semanais de trabalho	,098[c]	1,320	,189	,104	,990

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Prof_semi_qualificadas_2	1,018[b]	,979
	Prof_sem_qualificaçao_2	1,009[b]	,991
	Alcool_2	1,020[b]	,978
	Doença_2	1,008[b]	,989
	Normal_2	1,043[b]	,959
	Sobrepeso_2	1,034[b]	,966
	Obeso_2	1,009[b]	,989
	Horas semanais de trabalho	1,001[b]	,996
	DOM_F20	1,010[b]	,989
	ALC1_F20	1,020[b]	,978
	CIG_F20	1,056[b]	,947
	Centro_saude_2	1,023[b]	,976
	Cons_particular_2	1,001[b]	,997
	Cons_hospitalar_2	1,009[b]	,991
	ALCOHOLCD_F20	1,021[b]	,977
	DO_F20	1,008[b]	,989
	Masculino_2	1,078[b]	,927
	Solteiro_2	1,417[b]	,706
	ESCOL_F20	1,079[b]	,922
	Prof_superiores_2	1,032[b]	,962
	Prof_intermédias_2	1,001[b]	,983
	Prof_esp_nao_manuais_2	1,020[b]	,978
3	Prof_semi_qualificadas_2	1,022[b]	,969
	Prof_sem_qualificaçao_2	1,009[b]	,982
	Alcool_2	1,026[c]	,967
	Doença_2	1,009[c]	,980
	Normal_2	1,093[c]	,915
	Sobrepeso_2	1,050[c]	,952
	Obeso_2	1,035[c]	,958
	Horas semanais de trabalho	1,010[c]	,975

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
3	DOM_F20	,009[b]	,114	,909	,009	,987
	ALC1_F20	,031[b]	,409	,683	,033	,974
	CIG_F20	,004[b]	,049	,961	,004	,944
	Centro_saude_2	,139[b]	1,832	,069	,144	,942
	Cons_particular_2	-,187[b]	-2,482	,014	-,194	,943
	Cons_hospitalar_2	,067[b]	,876	,383	,069	,953
	ALCOHOLCD_F20	,006[b]	,073	,942	,006	,975
	DO_F20	,017[b]	,224	,823	,018	,991
4	Masculino_2	-,127[b]	-1,671	,097	-,132	,918

	Solteiro_2	,036[b]	,411	,682	,033	,705
	ESCOL_F20	,046[b]	,590	,556	,047	,895
	Prof_superiores_2	,107[b]	1,427	,156	,113	,941
	Prof_intermédias_2	-,053[b]	-,720	,473	-,057	,990
	Prof_esp_nao_manuais_2	,040[b]	,529	,598	,042	,956
	Prof_semi_qualificadas_2	-,108[b]	-1,456	,147	-,115	,971
	Prof_sem_qualificaçao_2	-,079[b]	-1,073	,285	-,085	,978
	Alcool_2	,030[b]	,405	,686	,032	,974
	Doença_2	,023[b]	,306	,760	,024	,990
	Normal_2	-,039[b]	-,499	,619	-,040	,888
	Sobrepeso_2	,074[b]	,975	,331	,078	,936
	Obeso_2	-,065[b]	-,871	,385	-,069	,961
	Horas semanais de trabalho	,102[b]	1,391	,166	,110	,990
	DOM_F20	,013[b]	,173	,863	,014	,987
	ALC1_F20	,030[b]	,405	,686	,032	,974
	CIG_F20	-,004[c]	-,052	,959	-,004	,943
	Centro_saude_2	,046[c]	,493	,623	,039	,622
	Cons_hospitalar_2	,027[c]	,349	,727	,028	,906
	ALCOHOLCD_F20	-,028[c]	-,365	,716	-,029	,945
	DO_F20	,023[c]	,306	,760	,024	,990

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
3	DOM_F20	1,013[b]	,979
	ALC1_F20	1,026[b]	,967
	CIG_F20	1,059[b]	,944
	Centro_saude_2	1,062[b]	,942
	Cons_particular_2	1,061[b]	,928
	Cons_hospitalar_2	1,050[b]	,945
	ALCOHOLCD_F20	1,026[b]	,969
	DO_F20	1,009[b]	,980
4	Masculino_2	1,089[b]	,908
	Solteiro_2	1,418[b]	,674
	ESCOL_F20	1,117[b]	,888
	Prof_superiores_2	1,062[b]	,916
	Prof_intermédias_2	1,011[b]	,927
	Prof_esp_nao_manuais_2	1,046[b]	,920
	Prof_semi_qualificadas_2	1,030[b]	,927
	Prof_sem_qualificaçao_2	1,022[b]	,927
	Alcool_2	1,026[b]	,923
	Doença_2	1,010[b]	,927
	Normal_2	1,126[b]	,888
	Sobrepeso_2	1,068[b]	,920
	Obeso_2	1,041[b]	,910
	Horas semanais de trabalho	1,010[b]	,920
	DOM_F20	1,013[b]	,926
	ALC1_F20	1,026[b]	,923
	CIG_F20	1,061[c]	,925
	Centro_saude_2	1,607[c]	,622
	Cons_hospitalar_2	1,104[c]	,872

	ALCOHOLCD_F20	1,059[c]	,914
	DO_F20	1,010[c]	,927

a. Dependent Variable: PERC_F20
b. Predictors in the Model: (Constant), Idade_2_avaliacao
c. Predictors in the Model: (Constant), Idade_2_avaliacao, Sono horas/dia
d. Predictors in the Model: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2
e. Predictors in the Model: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2, Cons_particular_2

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Idade_2_avaliacao	Sono horas/dia
1	1	1,993	1,000	,00	,00	
	2	,007	16,815	1,00	1,00	
2	1	2,969	1,000	,00	,00	,00
	2	,025	11,001	,03	,16	,87
	3	,006	21,522	,97	,84	,12
3	1	3,771	1,000	,00	,00	,00
	2	,199	4,359	,00	,01	,02
	3	,024	12,486	,03	,18	,85
	4	,006	24,929	,97	,82	,13
4	1	4,029	1,000	,00	,00	,00
	2	,763	2,298	,00	,00	,00
	3	,178	4,755	,00	,01	,02
	4	,024	12,910	,03	,18	,84
	5	,006	25,906	,97	,81	,13

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions	
		Casado_2	Cons_particular_2
1	1		
	2		
2	1		
	2		
	3		
3	1	,01	
	2	,92	
	3	,01	
	4	,06	
4	1	,01	,01
	2	,03	,84
	3	,88	,13
	4	,02	,00
	5	,06	,01

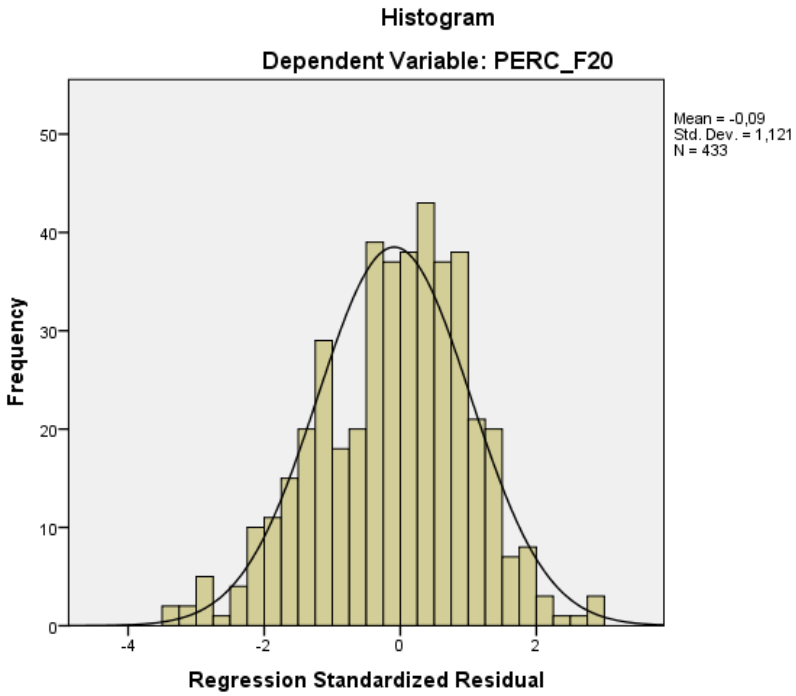
a. Dependent Variable: PERC_F20

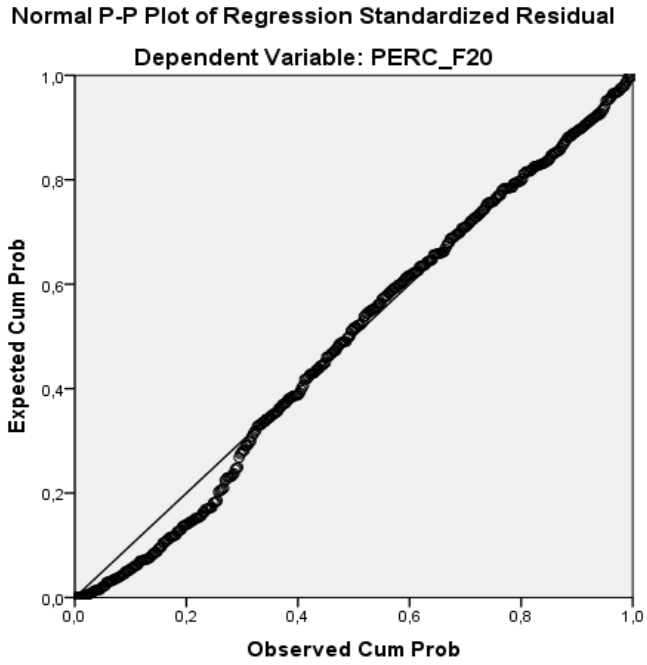
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	42,8150	82,8234	62,0956	7,36291	433
Residual	-56,70346	47,47592	-1,48633	18,59654	433
Std. Predicted Value	-2,821	2,910	-,059	1,055	433
Std. Residual	-3,419	2,863	-,090	1,121	433

a. Dependent Variable: PERC_F20

Charts


Histogram
Dependent Variable: PERC_F20
Mean = -0,09
Std. Dev. = 1,121
N = 433
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: PERC_F20
Expected Cum Prob
Observed Cum Prob

D7. Regression for > 55 years sample, from the 2nd Eval. (Dep. Var. - GHP)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	DO_F20	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: PERC_F20

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,300[a]	,090	,073	17,39182	1,934

a. Predictors: (Constant), DO_F20
b. Dependent Variable: PERC_F20

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1670,066	1	1670,066	5,521	,022[b]
	Residual	16938,629	56	302,476		
	Total	18608,695	57			

a. Dependent Variable: PERC_F20
b. Predictors: (Constant), DO_F20

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	66,400	4,491		14,787	,000
	DO_F20	-12,255	5,215	-,300	-2,350	,022

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	DO_F20	1,000	1,000

a. Dependent Variable: PERC_F20

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Idade_2_avaliacao	,185[b]	1,469	,148	,194	1,000
	Masculino_2	-,080[b]	-,616	,541	-,083	,978
	Casado_2	-,019[b]	-,149	,882	-,020	,989
	Solteiro_2	-,016[b]	-,124	,902	-,017	,994
	ESCOL_F20	-,006[b]	-,049	,961	-,007	,988
	Prof_superiores_2	-,058[b]	-,448	,656	-,060	,990
	Prof_intermédias_2	,225[b]	1,784	,080	,234	,985
	Prof_esp_nao_manuais_2	-,176[b]	-1,387	,171	-,184	,996
	Prof_semi_qualificadas_2	-,056[b]	-,439	,662	-,059	1,000
	Alcool_2	,072[b]	,560	,578	,075	,989

	Doença_2	.[b]	.	.	.	,000
	Normal_2	-,046[b]	-,358	,721	-,048	,995
	Sobrepeso_2	,033[b]	,251	,803	,034	,981
	Obeso_2	,017[b]	,133	,895	,018	,989
	Horas semanais de trabalho	-,214[b]	-1,696	,096	-,223	,989
	DOM_F20	-,134[b]	-1,050	,298	-,140	,996
	ALC1_F20	,072[b]	,560	,578	,075	,989
	CIG_F20	-,117[b]	-,902	,371	-,121	,975
	Sono horas/dia	,123[b]	,961	,341	,128	,996
	Centro_saude_2	,038[b]	,296	,768	,040	,998
	Cons_particular_2	-,017[b]	-,130	,897	-,017	,974
	Cons_hospitalar_2	,096[b]	,745	,460	,100	,994
	ALCOHOLCD_F20	,171[b]	1,353	,182	,179	1,000

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Idade_2_avaliacao	1,000[b]	1,000
	Masculino_2	1,023[b]	,978
	Casado_2	1,011[b]	,989
	Solteiro_2	1,006[b]	,994
	ESCOL_F20	1,012[b]	,988
	Prof_superiores_2	1,010[b]	,990
	Prof_intermédias_2	1,015[b]	,985
	Prof_esp_nao_manuais_2	1,004[b]	,996
	Prof_semi_qualificadas_2	1,000[b]	1,000
	Alcool_2	1,011[b]	,989
	Doença_2	.[b]	,000
	Normal_2	1,005[b]	,995
	Sobrepeso_2	1,020[b]	,981
	Obeso_2	1,011[b]	,989
	Horas semanais de trabalho	1,011[b]	,989
	DOM_F20	1,004[b]	,996
	ALC1_F20	1,011[b]	,989
	CIG_F20	1,026[b]	,975
	Sono horas/dia	1,004[b]	,996
	Centro_saude_2	1,002[b]	,998
	Cons_particular_2	1,026[b]	,974
	Cons_hospitalar_2	1,006[b]	,994
	ALCOHOLCD_F20	1,000[b]	1,000

a. Dependent Variable: PERC_F20
b. Predictors in the Model: (Constant), DO_F20

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	DO_F20
1	1	1,861	1,000	,07	,07
	2	,139	3,660	,93	,93

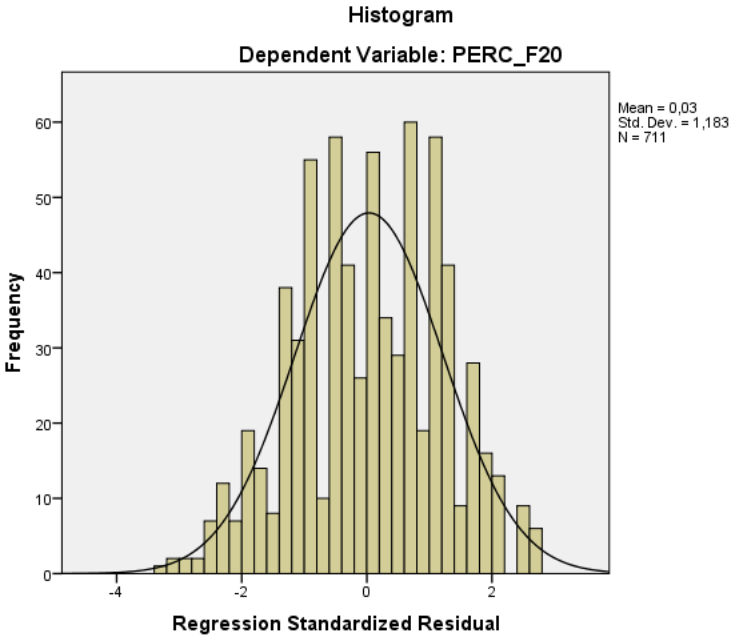
a. Dependent Variable: PERC_F20

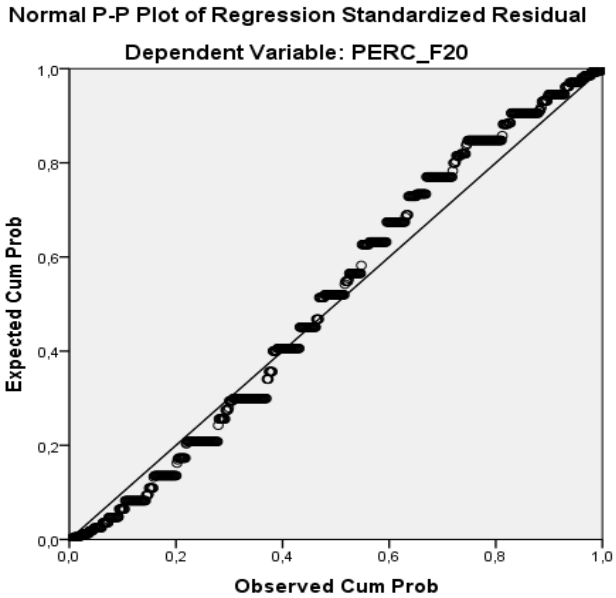
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	54,1453	66,4000	56,4722	4,80967	711
Residual	-56,40000	45,85465	,59309	20,58031	711
Std. Predicted Value	-,586	1,678	-,156	,889	711
Std. Residual	-3,243	2,637	,034	1,183	711

a. Dependent Variable: PERC_F20

Charts





D8. Regression for Full sample from the1st Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	IDADE_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Prof_sup_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Perc_primeira

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,160[a]	,026	,025	,96750	
2	,210[b]	,044	,042	,95886	
3	,224[c]	,050	,047	,95617	1,995

a. Predictors: (Constant), IDADE_BL
b. Predictors: (Constant), IDADE_BL, Sono horas/dia
c. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1
d. Dependent Variable: LN_Perc_primeira

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,288	1	23,288	24,879	,000[b]
	Residual	885,508	946	,936		
	Total	908,796	947			
2	Regression	39,952	2	19,976	21,727	,000[c]
	Residual	868,844	945	,919		
	Total	908,796	947			
3	Regression	45,740	3	15,247	16,677	,000[d]
	Residual	863,056	944	,914		
	Total	908,796	947			

a. Dependent Variable: LN_Perc_primeira
b. Predictors: (Constant), IDADE_BL
c. Predictors: (Constant), IDADE_BL, Sono horas/dia
d. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,058	,115		9,224	,000
	IDADE_BL	-,011	,002	-,160	-4,988	,000
2	(Constant)	1,758	,200		8,795	,000
	IDADE_BL	-,010	,002	-,154	-4,838	,000
	Sono horas/dia	-,092	,022	-,136	-4,257	,000
3	(Constant)	1,651	,204		8,104	,000
	IDADE_BL	-,009	,002	-,132	-4,026	,000
	Sono horas/dia	-,093	,022	-,136	-4,285	,000
	Prof_sup_1	,222	,088	,083	2,516	,012

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	IDADE_BL	1,000	1,000
2	(Constant)		
	IDADE_BL	,998	1,002
	Sono horas/dia	,998	1,002
3	(Constant)		
	IDADE_BL	,930	1,075
	Sono horas/dia	,998	1,002
	Prof_sup_1	,932	1,073

a. Dependent Variable: LN_Perc_primeira

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_1	,012[b]	,360	,719	,012	,998
	Casado_1	,019[b]	,588	,557	,019	,974
	Solteiro_1	-,022[b]	-,597	,551	-,019	,773
	Viuvo_1	,025[b]	,735	,462	,024	,921
	Normal_1	,009[b]	,283	,777	,009	,920
	Sobrepeso_1	,014[b]	,414	,679	,013	,968
	Obeso_1	-,031[b]	-,958	,338	-,031	,981
	ESCOLARIDADE_BL	,039[b]	1,073	,284	,035	,780
	Prof_sup_1	,082[b]	2,467	,014	,080	,932
	Prof_Int_1	,002[b]	,050	,960	,002	,983
	Prof_Esp_nao_manuais_1	,006[b]	,197	,844	,006	,974
	Prof_Esp_manuais_1	-,036[b]	-1,132	,258	-,037	,997
	Prof_Semiqualificadas_1	-,034[b]	-1,053	,293	-,034	,994
	Prof_Sem_qualificacao_1	-,061[b]	-1,901	,058	-,062	,997
	Horas semanais de trabalho	,019[b]	,523	,601	,017	,755
	ACTIVIDADE_FISICA_BL	-,006[b]	-,170	,865	-,006	,831
	DOMESTICOS_BL	-,034[b]	-1,057	,291	-,034	1,000
	Total actividades fisicas	,044[b]	1,376	,169	,045	1,000
	gr/dia	,042[b]	1,292	,197	,042	,997
	ALCOOL_BL	,042[b]	1,281	,200	,042	,976
	TABAGISMO_BL	,048[b]	1,467	,143	,048	,980
	CIGARROS_BL	,009[b]	,276	,783	,009	,998
	Sono horas/dia	-,136[b]	-4,257	,000	-,137	,998
	DOENÇA_BL	-,037[b]	-1,087	,277	-,035	,889
	Centro_saude	,000[b]	-,014	,989	,000	,996
	Consultorio_particular	,003[b]	,083	,934	,003	,989
	Consultorio_hospitalar	,015[b]	,470	,638	,015	,993
2	Masculino_1	,008[c]	,248	,804	,008	,997
	Casado_1	,016[c]	,500	,617	,016	,973
	Solteiro_1	-,020[c]	-,559	,577	-,018	,773
	Viuvo_1	,023[c]	,697	,486	,023	,921
	Normal_1	,009[c]	,285	,776	,009	,920
	Sobrepeso_1	,016[c]	,505	,614	,016	,968

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_1	1,002[b]	,998
	Casado_1	1,027[b]	,974
	Solteiro_1	1,294[b]	,773
	Viuvo_1	1,085[b]	,921
	Normal_1	1,087[b]	,920
	Sobrepeso_1	1,033[b]	,968
	Obeso_1	1,019[b]	,981
	ESCOLARIDADE_BL	1,282[b]	,780
	Prof_sup_1	1,073[b]	,932
	Prof_Int_1	1,018[b]	,983
	Prof_Esp_nao_manuais_1	1,026[b]	,974
	Prof_Esp_manuais_1	1,004[b]	,997
	Prof_Semiqualificadas_1	1,006[b]	,994
	Prof_Sem_qualificacao_1	1,003[b]	,997
	Horas semanais de trabalho	1,324[b]	,755
	ACTIVIDADE_FISICA_BL	1,203[b]	,831
	DOMESTICOS_BL	1,000[b]	1,000
	Total actividades fisicas	1,000[b]	1,000
	gr/dia	1,003[b]	,997
	ALCOOL_BL	1,025[b]	,976
	TABAGISMO_BL	1,020[b]	,980
	CIGARROS_BL	1,002[b]	,998
	Sono horas/dia	1,002[b]	,998
	DOENÇA_BL	1,124[b]	,889
	Centro_saude	1,004[b]	,996
	Consultorio_particular	1,011[b]	,989
	Consultorio_hospitalar	1,007[b]	,993
2	Masculino_1	1,003[c]	,996
	Casado_1	1,027[c]	,972
	Solteiro_1	1,294[c]	,771
	Viuvo_1	1,086[c]	,919
	Normal_1	1,087[c]	,918
	Sobrepeso_1	1,033[c]	,966

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Obeso_1	-,034[b]	-1,059	,290	-,034	,981
	ESCOLARIDADE_BL	,037[b]	1,040	,299	,034	,780
	Prof_sup_1	,083[b]	2,516	,012	,082	,932
	Prof_Int_1	,004[b]	,112	,911	,004	,982
	Prof_Esp_nao_manuais_1	,012[b]	,375	,708	,012	,973
	Prof_Esp_manuais_1	-,037[b]	-1,157	,248	-,038	,996
	Prof_Semiqualificadas_1	-,033[b]	-1,047	,295	-,034	,994
	Prof_Sem_qualificacao_1	-,058[b]	-1,824	,068	-,059	,997
	Horas semanais de trabalho	,025[b]	,674	,500	,022	,754

3	ACTIVIDADE_FISICA_BL	-,003[b]	-,090	,928	-,003	,831
	DOMESTICOS_BL	-,037[b]	-1,161	,246	-,038	,999
	Total actividades fisicas	,017[b]	,515	,607	,017	,957
	gr/dia	,040[b]	1,257	,209	,041	,997
	ALCOOL_BL	,047[b]	1,471	,142	,048	,974
	TABAGISMO_BL	,046[b]	1,442	,150	,047	,980
	CIGARROS_BL	,010[b]	,317	,752	,010	,998
	DOENÇA_BL	-,046[b]	-1,367	,172	-,044	,886
	Centro_saude	-,004[b]	-,124	,902	-,004	,995
	Consultorio_particular	,010[b]	,313	,754	,010	,986
	Consultorio_hospitalar	,013[b]	,412	,680	,013	,993
	Masculino_1	,008[b]	,254	,799	,008	,997
	Casado_1	,013[b]	,406	,685	,013	,972
	Solteiro_1	-,016[b]	-,446	,656	-,015	,771
	Viuvo_1	,027[b]	,811	,417	,026	,919
	Normal_1	,005[b]	,155	,877	,005	,918
	Sobrepeso_1	,015[b]	,460	,645	,015	,967
	Obeso_1	-,027[b]	-,829	,407	-,027	,972
	ESCOLARIDADE_BL	-,013[c]	-,319	,750	-,010	,567
	Prof_Int_1	,020[c]	,608	,543	,020	,946
	Prof_Esp_nao_manuais_1	,031[c]	,937	,349	,031	,928
	Prof_Esp_manuais_1	-,031[c]	-,962	,336	-,031	,990
	Prof_Semiqualificadas_1	-,023[c]	-,700	,484	-,023	,974

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Obeso_1	1,020[b]	,979
	ESCOLARIDADE_BL	1,283[b]	,779
	Prof_sup_1	1,073[b]	,930
	Prof_Int_1	1,018[b]	,981
	Prof_Esp_nao_manuais_1	1,028[b]	,972
	Prof_Esp_manuais_1	1,004[b]	,995
	Prof_Semiqualificadas_1	1,006[b]	,992
	Prof_Sem_qualificacao_1	1,003[b]	,995
	Horas semanais de trabalho	1,326[b]	,753
	ACTIVIDADE_FISICA_BL	1,203[b]	,829
	DOMESTICOS_BL	1,001[b]	,998
	Total actividades fisicas	1,045[b]	,955
	gr/dia	1,003[b]	,995
	ALCOOL_BL	1,027[b]	,974
	TABAGISMO_BL	1,020[b]	,978
	CIGARROS_BL	1,002[b]	,996
	DOENÇA_BL	1,129[b]	,886
	Centro_saude	1,005[b]	,994
	Consultorio_particular	1,014[b]	,986
	Consultorio_hospitalar	1,007[b]	,991
	Masculino_1	1,003[b]	,928
	Casado_1	1,029[b]	,904
3	Solteiro_1	1,297[b]	,722
	Viuvo_1	1,088[b]	,866
	Normal_1	1,090[b]	,866

	Sobrepeso_1	1,034[b]	,901
	Obeso_1	1,029[b]	,919
	ESCOLARIDADE_BL	1,764[c]	,567
	Prof_Int_1	1,057[c]	,897
	Prof_Esp_nao_manuais_1	1,078[c]	,887
	Prof_Esp_manuais_1	1,010[c]	,924
	Prof_Semiqualificadas_1	1,027[c]	,913

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
3	Prof_Sem_qualificacao_1	-,049[b]	-1,529	,126	-,050	,982
	Horas semanais de trabalho	,004[b]	,094	,925	,003	,713
	ACTIVIDADE_FISICA_BL	-,014[b]	-,408	,683	-,013	,818
	DOMESTICOS_BL	-,035[b]	-1,095	,274	-,036	,998
	Total actividades fisicas	,018[b]	,544	,587	,018	,956
	gr/dia	,040[b]	1,262	,207	,041	,997
	ALCOOL_BL	,045[b]	1,405	,160	,046	,973
	TABAGISMO_BL	,040[b]	1,237	,216	,040	,973
	CIGARROS_BL	,007[b]	,207	,836	,007	,996
	DOENÇA_BL	-,042[b]	-1,244	,214	-,040	,884
	Centro_saude	,014[b]	,440	,660	,014	,947
	Consultorio_particular	-,007[b]	-,209	,834	-,007	,944
	Consultorio_hospitalar	,010[b]	,312	,755	,010	,991

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
3	Prof_Sem_qualificacao_1	1,019[b]	,918
	Horas semanais de trabalho	1,402[b]	,713
	ACTIVIDADE_FISICA_BL	1,222[b]	,799
	DOMESTICOS_BL	1,002[b]	,930
	Total actividades fisicas	1,046[b]	,930
	gr/dia	1,003[b]	,927
	ALCOOL_BL	1,028[b]	,907
	TABAGISMO_BL	1,028[b]	,918
	CIGARROS_BL	1,004[b]	,929
	DOENÇA_BL	1,132[b]	,838
	Centro_saude	1,056[b]	,887
	Consultorio_particular	1,059[b]	,892
	Consultorio_hospitalar	1,009[b]	,922

a. Dependent Variable: LN_Perc_primeira
b. Predictors in the Model: (Constant), IDADE_BL
c. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia
d. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia, Prof_sup_1

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	IDADE_BL	Sono horas/dia
1	1	1,962	1,000	,02	,02	

	2	,038	7,161	,98	,98	
	1	2,929	1,000	,00	,01	,00
2	2	,056	7,223	,03	,86	,17
	3	,015	14,003	,97	,13	,83
	1	3,120	1,000	,00	,01	,00
3	2	,814	1,958	,00	,00	,00
	3	,052	7,745	,03	,83	,20
	4	,015	14,611	,97	,16	,80

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions
		Prof_sup_1
1	1	
	2	
2	1	
	2	
	3	
3	1	,02
	2	,88
	3	,08
	4	,02

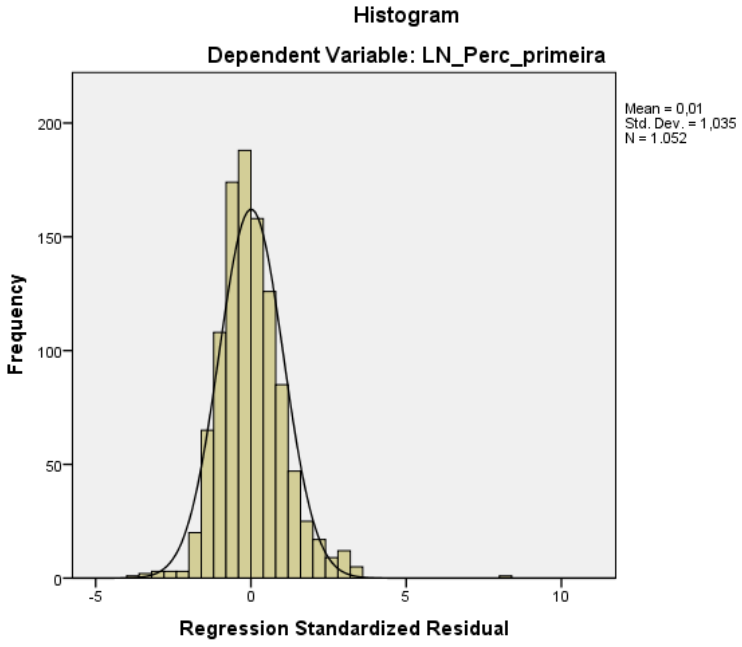
a. Dependent Variable: LN_Perc_primeira

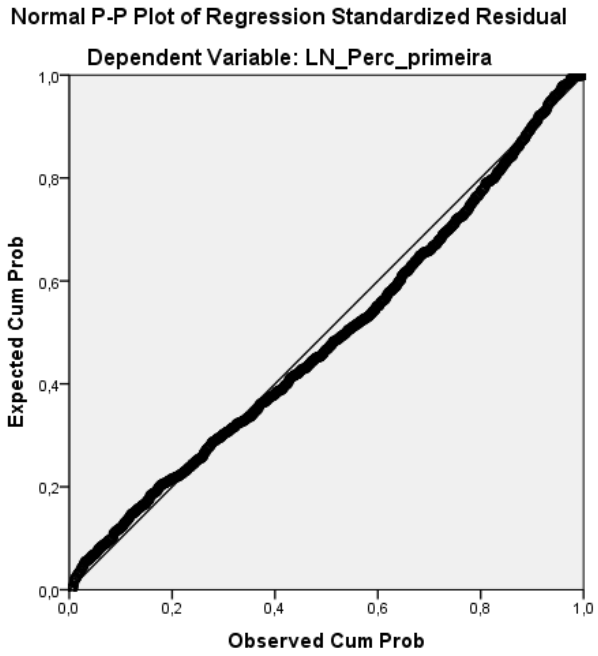
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-8,1865	1,1561	,5024	,34831	1052
Residual	-3,46419	7,78105	,00539	,99010	1052
Std. Predicted Value	-39,560	2,950	-,024	1,585	1052
Std. Residual	-3,623	8,138	,006	1,035	1052

a. Dependent Variable: LN_Perc_primeira

Charts





D9.Regression for < 36 years sample, from the 1st Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Prof_Esp_nao_manuais_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	DOENÇA_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Perc_primeira

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,215[a]	,046	,040	,88885	
2	,271[b]	,073	,060	,87927	1,806

a. Predictors: (Constant), Prof_Esp_nao_manuais_1
b. Predictors: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL
c. Dependent Variable: LN_Perc_primeira

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,422	1	5,422	6,863	,010[b]
	Residual	111,399	141	,790		
	Total	116,821	142			
2	Regression	8,584	2	4,292	5,552	,005[c]
	Residual	108,237	140	,773		
	Total	116,821	142			

a. Dependent Variable: LN_Perc_primeira
b. Predictors: (Constant), Prof_Esp_nao_manuais_1
c. Predictors: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	,856	,080		10,682
	Prof_Esp_nao_manuais_1	-,561	,214	-,215	-2,620
2	(Constant)	,965	,096		10,075
	Prof_Esp_nao_manuais_1	-,546	,212	-,209	-2,573
	DOENÇA_BL	-,311	,154	-,165	-2,022

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,000		
	Prof_Esp_nao_manuais_1	,010	1,000	1,000
2	(Constant)	,000		
	Prof_Esp_nao_manuais_1	,011	,999	1,001
	DOENÇA_BL	,045	,999	1,001

a. Dependent Variable: LN_Perc_primeira

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	IDADE_BL	-,040[b]	-,478	,633	-,040	,985
	Masculino_1	,030[b]	,364	,717	,031	,981
	Casado_1	,066[b]	,802	,424	,068	,998
	Solteiro_1	-,066[b]	-,802	,424	-,068	,998
	Normal_1	-,007[b]	-,080	,936	-,007	,967
	Sobrepeso_1	,042[b]	,494	,622	,042	,957
	Obeso_1	-,006[b]	-,070	,945	-,006	,993
	ESCOLARIDADE_BL	,040[b]	,462	,645	,039	,891
	Prof_sup_1	,141[b]	1,672	,097	,140	,935
	Prof_Int_1	-,078[b]	-,941	,348	-,079	,980
	Prof_Esp_manuais_1	-,009[b]	-,103	,918	-,009	,994
	Prof_Semiqualificadas_1	-,058[b]	-,705	,482	-,059	,990
	Prof_Sem_qualificacao_1	-,057[b]	-,693	,489	-,059	,994
	Horas semanais de trabalho	,056[b]	,658	,511	,056	,948
	ACTIVIDADE_FISICA_BL	-,010[b]	-,120	,904	-,010	,989
	DOMESTICOS_BL	,014[b]	,165	,869	,014	,995
	Total actividades fisicas	-,021[b]	-,255	,799	-,022	,996
	gr/dia	,015[b]	,183	,855	,015	,992
	ALCOOL_BL	,108[b]	1,313	,191	,110	,997
	TABAGISMO_BL	,050[b]	,599	,550	,051	,975
	CIGARROS_BL	-,025[b]	-,303	,763	-,026	,969
	Sono horas/dia	-,067[b]	-,804	,423	-,068	,976
	DOENÇA_BL	-,165[b]	-2,022	,045	-,168	,999
	Centro_saude	-,087[b]	-1,051	,295	-,089	,981
	Consultorio_particular	,094[b]	1,130	,260	,095	,986
	Consultorio_hospitalar	,051[b]	,622	,535	,052	,993

	IDADE_BL	-,016[c]	-,190	,850	-,016	,964
	Masculino_1	-,004[c]	-,048	,962	-,004	,940
	Casado_1	,076[c]	,932	,353	,079	,994
2	Solteiro_1	-,076[c]	-,932	,353	-,079	,994
	Normal_1	-,021[c]	-,251	,802	-,021	,960
	Sobrepeso_1	,060[c]	,717	,475	,061	,946
	Obeso_1	-,012[c]	-,142	,887	-,012	,992

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
	IDADE_BL	1,015[b]	,985
	Masculino_1	1,019[b]	,981
	Casado_1	1,002[b]	,998
	Solteiro_1	1,002[b]	,998
	Normal_1	1,035[b]	,967
	Sobrepeso_1	1,045[b]	,957
	Obeso_1	1,007[b]	,993
	ESCOLARIDADE_BL	1,123[b]	,891
	Prof_sup_1	1,070[b]	,935
	Prof_Int_1	1,021[b]	,980
	Prof_Esp_manuais_1	1,006[b]	,994
	Prof_Semiqualificadas_1	1,010[b]	,990
	Prof_Sem_qualificacao_1	1,006[b]	,994
1	Horas semanais de trabalho	1,055[b]	,948
	ACTIVIDADE_FISICA_BL	1,011[b]	,989
	DOMESTICOS_BL	1,005[b]	,995
	Total actividades fisicas	1,004[b]	,996
	gr/dia	1,008[b]	,992
	ALCOOL_BL	1,003[b]	,997
	TABAGISMO_BL	1,026[b]	,975
	CIGARROS_BL	1,032[b]	,969
	Sono horas/dia	1,025[b]	,976
	DOENÇA_BL	1,001[b]	,999
	Centro_saude	1,020[b]	,981
	Consultorio_particular	1,015[b]	,986
	Consultorio_hospitalar	1,007[b]	,993
	IDADE_BL	1,037[c]	,964
	Masculino_1	1,064[c]	,940
	Casado_1	1,006[c]	,994
2	Solteiro_1	1,006[c]	,994
	Normal_1	1,042[c]	,960
	Sobrepeso_1	1,057[c]	,946
	Obeso_1	1,008[c]	,992

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	ESCOLARIDADE_BL	,047[b]	,543	,588	,046	,890
	Prof_sup_1	,139[b]	1,667	,098	,140	,935
	Prof_Int_1	-,091[b]	-1,107	,270	-,093	,974

	Prof_Esp_manuais_1	-,005[b]	-,063	,949	-,005	,994
	Prof_Semiqualificadas_1	-,067[b]	-,817	,415	-,069	,988
	Prof_Sem_qualificacao_1	-,041[b]	-,501	,617	-,042	,984
	Horas semanais de trabalho	,027[b]	,320	,749	,027	,919
	ACTIVIDADE_FISICA_BL	-,032[b]	-,390	,697	-,033	,972
	DOMESTICOS_BL	,022[b]	,270	,788	,023	,992
	Total actividades fisicas	-,031[b]	-,384	,702	-,033	,992
	gr/dia	-,004[b]	-,053	,958	-,004	,978
	ALCOOL_BL	,083[b]	,999	,320	,084	,969
	TABAGISMO_BL	,012[b]	,139	,890	,012	,922
	CIGARROS_BL	-,058[b]	-,685	,494	-,058	,937
	Sono horas/dia	-,052[b]	-,632	,528	-,054	,968
	Centro_saude	-,077[b]	-,929	,354	-,079	,976
	Consultorio_particular	,075[b]	,912	,363	,077	,972
	Consultorio_hospitalar	,063[b]	,764	,446	,065	,989

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	ESCOLARIDADE_BL	1,124[b]	,889
	Prof_sup_1	1,070[b]	,934
	Prof_Int_1	1,027[b]	,974
	Prof_Esp_manuais_1	1,006[b]	,993
	Prof_Semiqualificadas_1	1,012[b]	,988
	Prof_Sem_qualificacao_1	1,016[b]	,984
	Horas semanais de trabalho	1,088[b]	,919
	ACTIVIDADE_FISICA_BL	1,029[b]	,972
	DOMESTICOS_BL	1,008[b]	,992
	Total actividades fisicas	1,008[b]	,992
	gr/dia	1,022[b]	,978
	ALCOOL_BL	1,032[b]	,969
	TABAGISMO_BL	1,085[b]	,922
	CIGARROS_BL	1,068[b]	,937
	Sono horas/dia	1,033[b]	,968
	Centro_saude	1,024[b]	,976
	Consultorio_particular	1,028[b]	,972
	Consultorio_hospitalar	1,012[b]	,989

a. Dependent Variable: LN_Perc_primeira
b. Predictors in the Model: (Constant), Prof_Esp_nao_manuais_1
c. Predictors in the Model: (Constant), Prof_Esp_nao_manuais_1, DOENÇA_BL

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Prof_Esp_nao_manuais_1	DOENÇA_BL
1	1	1,374	1,000	,31	,31	
	2	,626	1,481	,69	,69	
2	1	1,833	1,000	,13	,10	,13
	2	,781	1,532	,03	,82	,18
	3	,386	2,179	,84	,08	,69

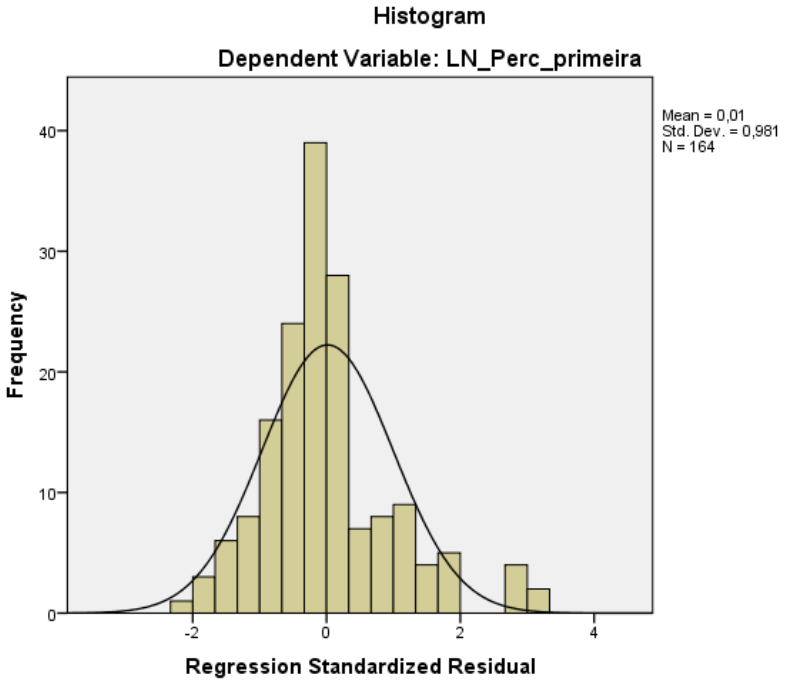
a. Dependent Variable: LN_Perc_primeira

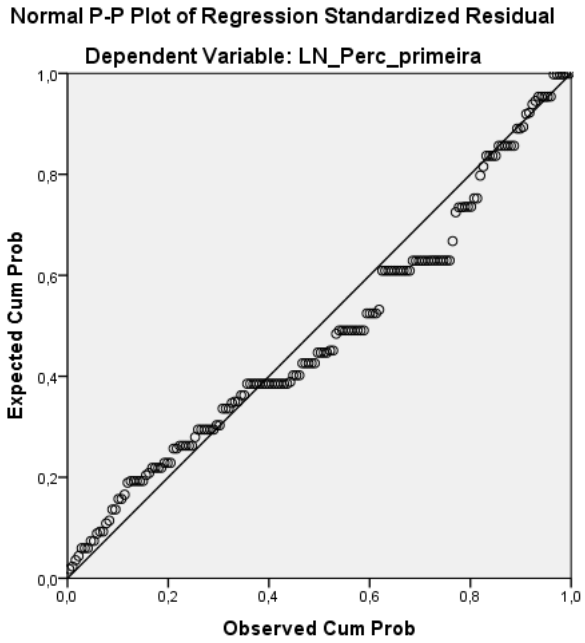
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	,1083	,9647	,7560	,26155	164
Residual	-1,84290	2,82205	,01259	,86233	164
Std. Predicted Value	-2,722	,761	-,088	1,064	164
Std. Residual	-2,096	3,210	,014	,981	164

a. Dependent Variable: LN_Perc_primeira

Charts





D10. Regression for 36 - 55 years sample, from the 1st Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	IDADE_BL	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Prof_Esp_nao_ manuais_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Perc_primeira

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,104[a]	,011	,008	,98365	
2	,147[b]	,021	,017	,97959	
3	,180[c]	,033	,025	,97527	1,919

a. Predictors: (Constant), IDADE_BL
b. Predictors: (Constant), IDADE_BL, Sono horas/dia
c. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_Esp_nao_manuais_1
d. Dependent Variable: LN_Perc_primeira

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,235	1	4,235	4,377	,037[b]
	Residual	385,090	398	,968		
	Total	389,325	399			
2	Regression	8,368	2	4,184	4,360	,013[c]
	Residual	380,956	397	,960		
	Total	389,325	399			
3	Regression	12,669	3	4,223	4,440	,004[d]
	Residual	376,655	396	,951		
	Total	389,325	399			

a. Dependent Variable: LN_Perc_primeira
b. Predictors: (Constant), IDADE_BL
c. Predictors: (Constant), IDADE_BL, Sono horas/dia
d. Predictors: (Constant), IDADE_BL, Sono horas/dia, Prof_Esp_nao_manuais_1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	1,502	,444		3,385
	IDADE_BL	-,020	,009	-,104	-2,092
2	(Constant)	2,038	,512		3,982
	IDADE_BL	-,020	,009	-,106	-2,129
	Sono horas/dia	-,067	,032	-,103	-2,075
3	(Constant)	2,004	,510		3,930
	IDADE_BL	-,020	,009	-,106	-2,141
	Sono horas/dia	-,069	,032	-,106	-2,151
	Prof_Esp_nao_manuais_1	,257	,121	,105	2,126

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,001		
	IDADE_BL	,037	1,000	1,000
2	(Constant)	,000		
	IDADE_BL	,034	1,000	1,000
	Sono horas/dia	,039	1,000	1,000
3	(Constant)	,000		
	IDADE_BL	,033	1,000	1,000
	Sono horas/dia	,032	,999	1,001
	Prof_Esp_nao_manuais_1	,034	,999	1,001

a. Dependent Variable: LN_Perc_primeira

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_1	,027[b]	,542	,588	,027	,998
	Casado_1	,003[b]	,054	,957	,003	1,000
	Solteiro_1	-,006[b]	-,129	,897	-,006	,992
	Viuvo_1	,020[b]	,409	,683	,021	,994
	Normal_1	,001[b]	,028	,978	,001	,981
	Sobrepeso_1	,026[b]	,513	,608	,026	,998
	Obeso_1	-,039[b]	-,775	,439	-,039	,990
	ESCOLARIDADE_BL	,025[b]	,488	,626	,024	,948
	Prof_sup_1	,050[b]	1,000	,318	,050	,985
	Prof_Int_1	-,039[b]	-,778	,437	-,039	,998
	Prof_Esp_nao_manuais_1	,102[b]	2,050	,041	,102	1,000
	Prof_Esp_manuais_1	-,075[b]	-1,509	,132	-,075	1,000
	Prof_Semiqualificadas_1	-,017[b]	-,350	,727	-,018	1,000
	Prof_Sem_qualificacao_1	-,076[b]	-1,524	,128	-,076	1,000
	Horas semanais de trabalho	,024[b]	,484	,629	,024	,973
	ACTIVIDADE_FISICA_BL	,027[b]	,539	,590	,027	,999
	DOMESTICOS_BL	-,005[b]	-,098	,922	-,005	,999
	Total actividades fisicas	-,029[b]	-,575	,565	-,029	1,000
	gr/dia	,005[b]	,092	,927	,005	,997
	ALCOOL_BL	,066[b]	1,326	,186	,066	,989
	TABAGISMO_BL	,082[b]	1,635	,103	,082	,977
	CIGARROS_BL	,022[b]	,441	,660	,022	,991
	Sono horas/dia	-,103[b]	-2,075	,039	-,104	1,000
	DOENÇA_BL	-,005[b]	-,092	,926	-,005	,974
	Centro_saude	,035[b]	,695	,487	,035	,994
	Consultorio_particular	-,068[b]	-1,373	,171	-,069	1,000
	Consultorio_hospitalar	-,054[b]	-1,079	,281	-,054	,998
2	Masculino_1	,029[c]	,576	,565	,029	,997
	Casado_1	,001[c]	,027	,978	,001	,999
	Solteiro_1	-,007[c]	-,130	,896	-,007	,992
	Viuvo_1	,017[c]	,346	,730	,017	,993
	Normal_1	,007[c]	,142	,887	,007	,978
	Sobrepeso_1	,027[c]	,543	,587	,027	,998

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Masculino_1	1,002[b]	,998
	Casado_1	1,000[b]	1,000
	Solteiro_1	1,008[b]	,992
	Viuvo_1	1,006[b]	,994
	Normal_1	1,020[b]	,981
	Sobrepeso_1	1,002[b]	,998
	Obeso_1	1,010[b]	,990
	ESCOLARIDADE_BL	1,055[b]	,948
	Prof_sup_1	1,015[b]	,985
	Prof_Int_1	1,002[b]	,998
	Prof_Esp_nao_manuais_1	1,000[b]	1,000
	Prof_Esp_manuais_1	1,000[b]	1,000
	Prof_Semiqualificadas_1	1,000[b]	1,000
	Prof_Sem_qualificacao_1	1,000[b]	1,000
	Horas semanais de trabalho	1,028[b]	,973
	ACTIVIDADE_FISICA_BL	1,001[b]	,999
	DOMESTICOS_BL	1,001[b]	,999
	Total actividades fisicas	1,000[b]	1,000
	gr/dia	1,003[b]	,997
	ALCOOL_BL	1,011[b]	,989
	TABAGISMO_BL	1,023[b]	,977
	CIGARROS_BL	1,009[b]	,991
	Sono horas/dia	1,000[b]	1,000
	DOENÇA_BL	1,026[b]	,974
	Centro_saude	1,006[b]	,994
	Consultorio_particular	1,000[b]	1,000
	Consultorio_hospitalar	1,002[b]	,998
2	Masculino_1	1,003[c]	,997
	Casado_1	1,001[c]	,999
	Solteiro_1	1,008[c]	,992
	Viuvo_1	1,007[c]	,993
	Normal_1	1,023[c]	,978
	Sobrepeso_1	1,003[c]	,997

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Obeso_1	-,048[b]	-,959	,338	-,048	,983
	ESCOLARIDADE_BL	,030[b]	,594	,553	,030	,946
	Prof_sup_1	,053[b]	1,051	,294	,053	,984
	Prof_Int_1	-,040[b]	-,803	,423	-,040	,998
	Prof_Esp_nao_manuais_1	,105[b]	2,126	,034	,106	,999
	Prof_Esp_manuais_1	-,071[b]	-1,423	,155	-,071	,998
	Prof_Semiqualificadas_1	-,020[b]	-,396	,692	-,020	,999
	Prof_Sem_qualificacao_1	-,071[b]	-1,437	,152	-,072	,998
	Horas semanais de trabalho	,028[b]	,558	,577	,028	,972

	ACTIVIDADE_FISICA_BL	,031[b]	,625	,532	,031	,997
	DOMESTICOS_BL	-,008[b]	-,170	,865	-,009	,997
	Total actividades fisicas	-,055[b]	-1,079	,281	-,054	,948
	gr/dia	,008[b]	,160	,873	,008	,996
	ALCOOL_BL	,076[b]	1,524	,128	,076	,981
	TABAGISMO_BL	,088[b]	1,754	,080	,088	,975
	CIGARROS_BL	,032[b]	,629	,530	,032	,984
	DOENÇA_BL	-,014[b]	-,280	,780	-,014	,966
	Centro_saude	,031[b]	,618	,537	,031	,993
	Consultorio_particular	-,064[b]	-1,282	,201	-,064	,998
	Consultorio_hospitalar	-,058[b]	-1,170	,243	-,059	,997
	Masculino_1	,026[b]	,530	,596	,027	,997
	Casado_1	,010[b]	,211	,833	,011	,992
	Solteiro_1	-,009[b]	-,174	,862	-,009	,992
	Viuvo_1	,006[b]	,121	,903	,006	,982
	Normal_1	,007[b]	,140	,889	,007	,978
	Sobrepeso_1	,029[b]	,584	,560	,029	,997
3	Obeso_1	-,051[b]	-1,019	,309	-,051	,982
	ESCOLARIDADE_BL	,048[c]	,925	,356	,046	,925
	Prof_sup_1	,089[c]	1,715	,087	,086	,909
	Prof_Int_1	-,017[c]	-,331	,741	-,017	,946
	Prof_Esp_manuais_1	-,062[c]	-1,257	,210	-,063	,991
	Prof_Semiqualificadas_1	-,002[c]	-,045	,964	-,002	,971
	Prof_Sem_qualificacao_1	-,056[c]	-1,127	,260	-,057	,974

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Obeso_1	1,018[b]	,983
	ESCOLARIDADE_BL	1,057[b]	,946
	Prof_sup_1	1,016[b]	,984
	Prof_Int_1	1,002[b]	,998
	Prof_Esp_nao_manuais_1	1,001[b]	,999
	Prof_Esp_manuais_1	1,002[b]	,998
	Prof_Semiqualificadas_1	1,001[b]	,999
	Prof_Sem_qualificacao_1	1,002[b]	,998
	Horas semanais de trabalho	1,029[b]	,972
	ACTIVIDADE_FISICA_BL	1,003[b]	,997
	DOMESTICOS_BL	1,003[b]	,997
	Total actividades fisicas	1,055[b]	,948
	gr/dia	1,004[b]	,996
	ALCOOL_BL	1,020[b]	,981
	TABAGISMO_BL	1,026[b]	,975
	CIGARROS_BL	1,017[b]	,984
	DOENÇA_BL	1,035[b]	,966
	Centro_saude	1,007[b]	,993
	Consultorio_particular	1,002[b]	,998
	Consultorio_hospitalar	1,003[b]	,997
	Masculino_1	1,003[b]	,997
3	Casado_1	1,008[b]	,992
	Solteiro_1	1,008[b]	,992
	Viuvo_1	1,018[b]	,982

	Normal_1	1,023[b]	,978
	Sobrepeso_1	1,003[b]	,997
	Obeso_1	1,018[b]	,982
	ESCOLARIDADE_BL	1,081[c]	,925
	Prof_sup_1	1,100[c]	,909
	Prof_Int_1	1,057[c]	,946
	Prof_Esp_manuais_1	1,009[c]	,991
	Prof_Semiqualificadas_1	1,029[c]	,971
	Prof_Sem_qualificacao_1	1,027[c]	,974

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
3	Horas semanais de trabalho	,002[b]	,046	,963	,002	,915
	ACTIVIDADE_FISICA_BL	,026[b]	,525	,600	,026	,995
	DOMESTICOS_BL	-,009[b]	-,191	,849	-,010	,997
	Total actividades fisicas	-,062[b]	-1,216	,225	-,061	,945
	gr/dia	,005[b]	,091	,927	,005	,995
	ALCOOL_BL	,078[b]	1,562	,119	,078	,981
	TABAGISMO_BL	,091[b]	1,825	,069	,091	,974
	CIGARROS_BL	,032[b]	,649	,517	,033	,984
	DOENÇA_BL	-,013[b]	-,264	,792	-,013	,966
	Centro_saude	,027[b]	,542	,588	,027	,992
	Consultorio_particular	-,054[b]	-1,086	,278	-,055	,988
	Consultorio_hospitalar	-,054[b]	-1,092	,275	-,055	,995

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
3	Horas semanais de trabalho	1,093[b]	,915
	ACTIVIDADE_FISICA_BL	1,005[b]	,995
	DOMESTICOS_BL	1,003[b]	,997
	Total actividades fisicas	1,059[b]	,945
	gr/dia	1,005[b]	,995
	ALCOOL_BL	1,020[b]	,981
	TABAGISMO_BL	1,027[b]	,974
	CIGARROS_BL	1,017[b]	,984
	DOENÇA_BL	1,035[b]	,966
	Centro_saude	1,009[b]	,992
	Consultorio_particular	1,012[b]	,988
	Consultorio_hospitalar	1,005[b]	,995

a. Dependent Variable: LN_Perc_primeira
b. Predictors in the Model: (Constant), IDADE_BL
c. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia
d. Predictors in the Model: (Constant), IDADE_BL, Sono horas/dia, Prof_Esp_nao_manuais_1

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	IDADE_BL	Sono horas/dia
1	1	1,994	1,000	,00	,00	
	2	,006	17,986	1,00	1,00	

	1	2,967	1,000	,00	,00	,00
2	2	,027	10,448	,03	,12	,87
	3	,006	23,182	,97	,88	,13
	1	3,240	1,000	,00	,00	,00
3	2	,728	2,110	,00	,00	,00
	3	,027	10,917	,03	,12	,86
	4	,006	24,226	,97	,88	,13

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions
		Prof_Esp_nao_manuais_1
1	1	
	2	
2	1	
	2	
	3	
3	1	,03
	2	,97
	3	,00
	4	,00

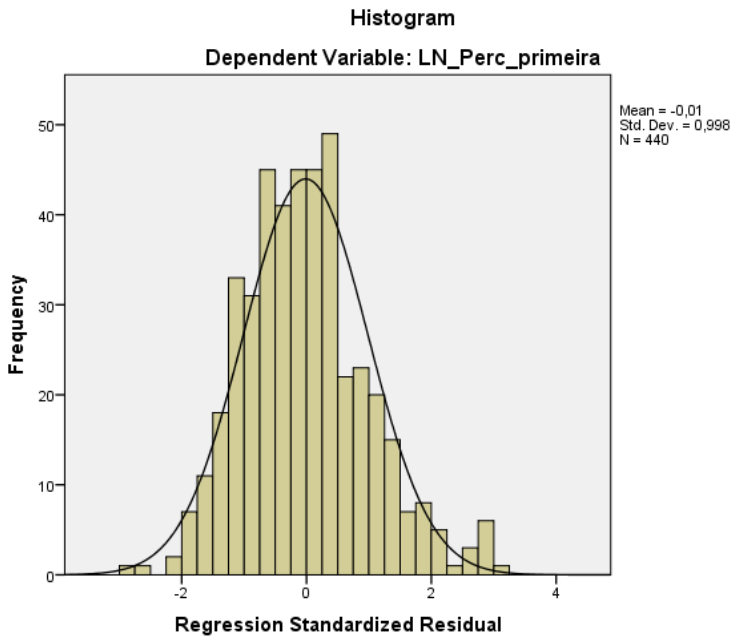
a. Dependent Variable: LN_Perc_primeira

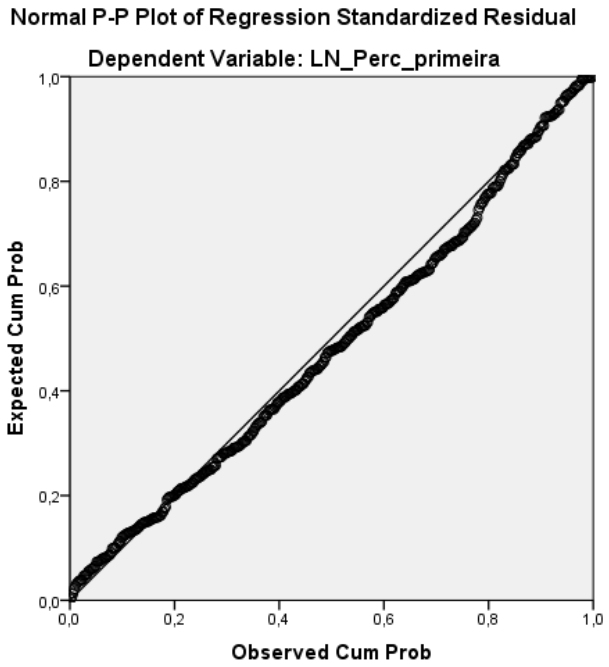
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	,0422	1,1185	,5865	,18097	440
Residual	-2,72061	3,00802	-,01399	,97297	440
Std. Predicted Value	-3,014	3,027	,041	1,016	440
Std. Residual	-2,790	3,084	-,014	,998	440

a. Dependent Variable: LN_Perc_primeira

Charts





D11. Regression for > 55 years sample, from the 1st Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Total actividades fisicas	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Prof_Int_1	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Perc_primeira

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,177[a]	,031	,029	,95460	
2	,207[b]	,043	,038	,94990	
3	,234[c]	,055	,048	,94534	2,085

a. Predictors: (Constant), Sono horas/dia
b. Predictors: (Constant), Sono horas/dia, Total actividades fisicas
c. Predictors: (Constant), Sono horas/dia, Total actividades fisicas, Prof_Int_1
d. Dependent Variable: LN_Perc_primeira

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11,809	1	11,809	12,959	,000[b]
	Residual	367,238	403	,911		
	Total	379,047	404			

	Regression	16,316	2	8,158	9,041	,000[c]
2	Residual	362,731	402	,902		
	Total	379,047	404			
	Regression	20,687	3	6,896	7,716	,000[d]
3	Residual	358,360	401	,894		
	Total	379,047	404			

a. Dependent Variable: LN_Perc_primeira
b. Predictors: (Constant), Sono horas/dia
c. Predictors: (Constant), Sono horas/dia, Total actividades fisicas
d. Predictors: (Constant), Sono horas/dia, Total actividades fisicas, Prof_Int_1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	1,267	,261		4,848
	Sono horas/dia	-,118	,033	-,177	-3,600
2	(Constant)	,592	,399		1,484
	Sono horas/dia	-,105	,033	-,158	-3,198
	Total actividades fisicas	,000	,000	,111	2,235
3	(Constant)	,586	,397		1,478
	Sono horas/dia	-,110	,033	-,166	-3,359
	Total actividades fisicas	,000	,000	,115	2,328
	Prof_Int_1	,493	,223	,108	2,212

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,000		
	Sono horas/dia	,000	1,000	1,000
2	(Constant)	,139		
	Sono horas/dia	,001	,973	1,028
	Total actividades fisicas	,026	,973	1,028
3	(Constant)	,140		
	Sono horas/dia	,001	,968	1,033
	Total actividades fisicas	,020	,971	1,030
	Prof_Int_1	,028	,993	1,007

a. Dependent Variable: LN_Perc_primeira

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	IDADE_BL	,020[b]	,404	,687	,020	,995
	Masculino_1	-,018[b]	-,372	,710	-,019	,994
	Casado_1	,019[b]	,385	,700	,019	,999
	Solteiro_1	-,005[b]	-,100	,920	-,005	,999
	Viuvo_1	,025[b]	,515	,607	,026	1,000
	Normal_1	-,003[b]	-,064	,949	-,003	1,000
	Sobrepeso_1	,004[b]	,092	,927	,005	1,000
	Obeso_1	-,009[b]	-,188	,851	-,009	,999
	ESCOLARIDADE_BL	,003[b]	,063	,950	,003	,999

	Prof_sup_1	,060[b]	1,224	,222	,061	,998
	Prof_Int_1	,103[b]	2,113	,035	,105	,994
	Prof_Esp_nao_manuais_1	-,074[b]	-1,509	,132	-,075	1,000
	Prof_Esp_manuais_1	-,012[b]	-,245	,807	-,012	1,000
	Prof_Semiqualificadas_1	-,051[b]	-1,041	,298	-,052	1,000
	Prof_Sem_qualificacao_1	-,051[b]	-1,041	,299	-,052	,999
	Horas semanais de trabalho	,006[b]	,113	,910	,006	,998
	ACTIVIDADE_FISICA_BL	-,031[b]	-,625	,532	-,031	,999
	DOMESTICOS_BL	-,084[b]	-1,718	,087	-,085	,999
	Total actividades fisicas	,111[b]	2,235	,026	,111	,973
	gr/dia	,083[b]	1,693	,091	,084	1,000
	ALCOOL_BL	,010[b]	,210	,834	,010	,997
	TABAGISMO_BL	-,002[b]	-,036	,971	-,002	,997
	CIGARROS_BL	-,006[b]	-,128	,898	-,006	,995
	DOENÇA_BL	-,026[b]	-,521	,602	-,026	,992
	Centro_saude	,000[b]	-,005	,996	,000	1,000
	Consultorio_particular	,050[b]	1,026	,306	,051	,994
	Consultorio_hospitalar	,046[b]	,946	,345	,047	1,000
	IDADE_BL	,022[c]	,458	,647	,023	,995
	Masculino_1	-,014[c]	-,283	,777	-,014	,993
2	Casado_1	,014[c]	,284	,777	,014	,997
	Solteiro_1	-,003[c]	-,067	,947	-,003	,999
	Viuvo_1	,030[c]	,618	,537	,031	,998
	Normal_1	,000[c]	,005	,996	,000	,999

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
	IDADE_BL	1,005[b]	,995
	Masculino_1	1,006[b]	,994
	Casado_1	1,001[b]	,999
	Solteiro_1	1,001[b]	,999
	Viuvo_1	1,000[b]	1,000
	Normal_1	1,000[b]	1,000
	Sobrepeso_1	1,000[b]	1,000
	Obeso_1	1,001[b]	,999
	ESCOLARIDADE_BL	1,001[b]	,999
1	Prof_sup_1	1,002[b]	,998
	Prof_Int_1	1,006[b]	,994
	Prof_Esp_nao_manuais_1	1,000[b]	1,000
	Prof_Esp_manuais_1	1,000[b]	1,000
	Prof_Semiqualificadas_1	1,000[b]	1,000
	Prof_Sem_qualificacao_1	1,001[b]	,999
	Horas semanais de trabalho	1,002[b]	,998
	ACTIVIDADE_FISICA_BL	1,001[b]	,999
	DOMESTICOS_BL	1,001[b]	,999
	Total actividades fisicas	1,028[b]	,973

2	gr/dia	1,000[b]	1,000
	ALCOOL_BL	1,003[b]	,997
	TABAGISMO_BL	1,003[b]	,997
	CIGARROS_BL	1,005[b]	,995
	DOENÇA_BL	1,008[b]	,992
	Centro_saude	1,000[b]	1,000
	Consultorio_particular	1,006[b]	,994
	Consultorio_hospitalar	1,000[b]	1,000
	IDADE_BL	1,006[c]	,967
	Masculino_1	1,007[c]	,966
	Casado_1	1,003[c]	,971
	Solteiro_1	1,001[c]	,972
	Viuvo_1	1,002[c]	,971
	Normal_1	1,001[c]	,972

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Sobrepeso_1	,007[b]	,134	,894	,007	1,000
	Obeso_1	-,011[b]	-,234	,815	-,012	,999
	ESCOLARIDADE_BL	,005[b]	,095	,925	,005	,999
	Prof_sup_1	,059[b]	1,208	,228	,060	,998
	Prof_Int_1	,108[b]	2,212	,028	,110	,993
	Prof_Esp_nao_manuais_1	-,074[b]	-1,513	,131	-,075	1,000
	Prof_Esp_manuais_1	-,014[b]	-,278	,781	-,014	1,000
	Prof_Semiqualificadas_1	-,052[b]	-1,075	,283	-,054	1,000
	Prof_Sem_qualificacao_1	-,055[b]	-1,128	,260	-,056	,998
	Horas semanais de trabalho	,001[b]	,016	,987	,001	,996
	ACTIVIDADE_FISICA_BL	-,039[b]	-,798	,425	-,040	,994
	DOMESTICOS_BL	-,089[b]	-1,826	,069	-,091	,998
	gr/dia	,063[b]	1,261	,208	,063	,957
	ALCOOL_BL	,006[b]	,116	,908	,006	,995
	TABAGISMO_BL	,002[b]	,050	,960	,002	,996
	CIGARROS_BL	-,001[b]	-,010	,992	-,001	,993
	DOENÇA_BL	-,027[b]	-,559	,577	-,028	,991
	Centro_saude	,000[b]	,004	,997	,000	1,000
	Consultorio_particular	,045[b]	,913	,362	,046	,991
	Consultorio_hospitalar	,056[b]	1,150	,251	,057	,992
	IDADE_BL	,037[b]	,763	,446	,038	,977
	Masculino_1	-,021[b]	-,422	,673	-,021	,989
	Casado_1	,011[b]	,217	,829	,011	,996
	Solteiro_1	-,012[b]	-,239	,811	-,012	,993
	Viuvo_1	,042[b]	,855	,393	,043	,987
	Normal_1	-,003[b]	-,060	,952	-,003	,998
3	Sobrepeso_1	-,002[b]	-,047	,963	-,002	,993
	Obeso_1	,001[c]	,020	,984	,001	,986
	ESCOLARIDADE_BL	-,018[c]	-,366	,714	-,018	,957
	Prof_sup_1	,065[c]	1,330	,184	,066	,995
	Prof_Esp_nao_manuais_1	-,069[c]	-1,423	,156	-,071	,998
	Prof_Esp_manuais_1	-,011[c]	-,232	,816	-,012	,999

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
2	Sobrepeso_1	1,000[b]	,972
	Obeso_1	1,001[b]	,972
	ESCOLARIDADE_BL	1,001[b]	,972
	Prof_sup_1	1,002[b]	,970
	Prof_Int_1	1,007[b]	,968
	Prof_Esp_nao_manuais_1	1,000[b]	,973
	Prof_Esp_manuais_1	1,000[b]	,972
	Prof_Semiqualificadas_1	1,000[b]	,972
	Prof_Sem_qualificacao_1	1,002[b]	,971
	Horas semanais de trabalho	1,004[b]	,970
	ACTIVIDADE_FISICA_BL	1,006[b]	,967
	DOMESTICOS_BL	1,002[b]	,971
	gr/dia	1,045[b]	,930
	ALCOOL_BL	1,005[b]	,969
	TABAGISMO_BL	1,004[b]	,969
	CIGARROS_BL	1,007[b]	,967
	DOENÇA_BL	1,009[b]	,965
	Centro_saude	1,000[b]	,972
	Consultorio_particular	1,009[b]	,965
	Consultorio_hospitalar	1,008[b]	,965
	IDADE_BL	1,024[b]	,964
	Masculino_1	1,011[b]	,961
	Casado_1	1,004[b]	,967
	Solteiro_1	1,007[b]	,967
	Viuvo_1	1,013[b]	,968
3	Normal_1	1,002[b]	,968
	Sobrepeso_1	1,007[b]	,968
	Obeso_1	1,015[c]	,967
	ESCOLARIDADE_BL	1,045[c]	,951
	Prof_sup_1	1,005[c]	,965
	Prof_Esp_nao_manuais_1	1,002[c]	,968
	Prof_Esp_manuais_1	1,001[c]	,968

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
3	Prof_Semiqualificadas_1	-,047[b]	-,976	,330	-,049	,997
	Prof_Sem_qualificacao_1	-,051[b]	-1,046	,296	-,052	,996
	Horas semanais de trabalho	-,032[b]	-,638	,524	-,032	,916
	ACTIVIDADE_FISICA_BL	-,070[b]	-1,391	,165	-,069	,933
	DOMESTICOS_BL	-,070[b]	-1,416	,158	-,071	,957
	gr/dia	,065[b]	1,312	,190	,065	,956
	ALCOOL_BL	,010[b]	,201	,841	,010	,994
	TABAGISMO_BL	,004[b]	,073	,942	,004	,995
	CIGARROS_BL	,001[b]	,014	,989	,001	,993
	DOENÇA_BL	-,024[b]	-,484	,629	-,024	,990
	Centro_saude	,012[b]	,251	,802	,013	,987

	Consultorio_particular	,038[b]	,782	,435	,039	,987
	Consultorio_hospitalar	,058[b]	1,189	,235	,059	,992

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
3	Prof_Semiqualificadas_1	1,003[b]	,968
	Prof_Sem_qualificacao_1	1,004[b]	,967
	Horas semanais de trabalho	1,092[b]	,913
	ACTIVIDADE_FISICA_BL	1,071[b]	,932
	DOMESTICOS_BL	1,045[b]	,953
	gr/dia	1,046[b]	,929
	ALCOOL_BL	1,006[b]	,964
	TABAGISMO_BL	1,005[b]	,965
	CIGARROS_BL	1,008[b]	,963
	DOENÇA_BL	1,010[b]	,961
	Centro_saude	1,013[b]	,968
	Consultorio_particular	1,013[b]	,961
	Consultorio_hospitalar	1,008[b]	,964

a. Dependent Variable: LN_Perc_primeira
b. Predictors in the Model: (Constant), Sono horas/dia
c. Predictors in the Model: (Constant), Sono horas/dia, Total actividades fisicas
d. Predictors in the Model: (Constant), Sono horas/dia, Total actividades fisicas, Prof_Int_1

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Sono horas/dia	Total actividades fisicas
1	1	1,983	1,000	,01	,01	
	2	,017	10,926	,99	,99	
2	1	2,952	1,000	,00	,00	,00
	2	,038	8,767	,00	,42	,42
	3	,009	17,800	1,00	,58	,58
3	1	3,021	1,000	,00	,00	,00
	2	,931	1,801	,00	,00	,00
	3	,038	8,901	,00	,42	,42
	4	,009	18,008	1,00	,58	,58

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions
		Prof_Int_1
1	1	
	2	
2	1	
	2	
	3	
3	1	,01
	2	,98
	3	,01
	4	,00

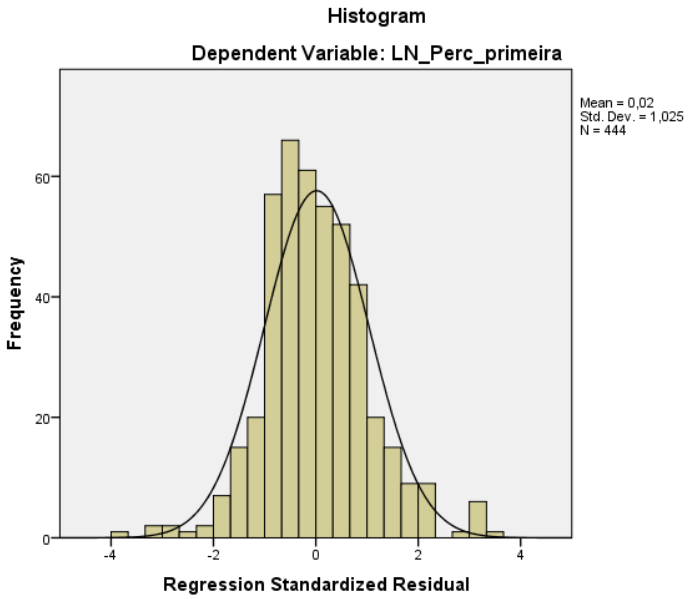
a. Dependent Variable: LN_Perc_primeira

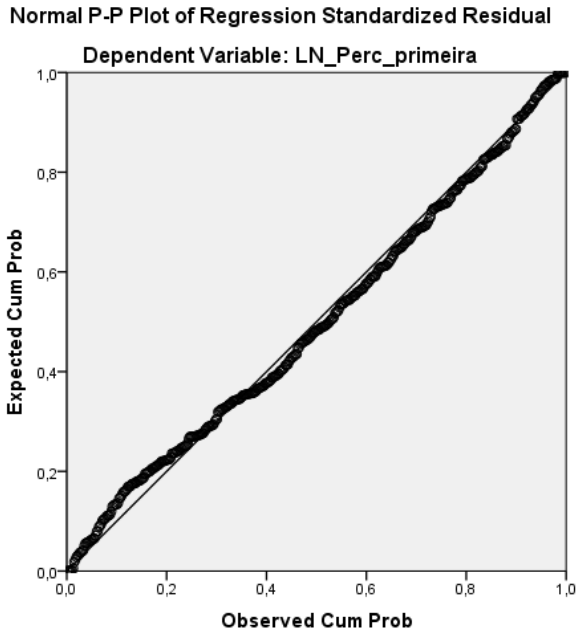
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,4977	1,2849	,3369	,22907	444
Residual	-3,46958	3,21329	,01605	,96879	444
Std. Predicted Value	-3,710	4,168	-,022	1,012	444
Std. Residual	-3,670	3,399	,017	1,025	444

a. Dependent Variable: LN_Perc_primeira

Charts





D12. Regression for Full sample from the 2nd Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Idade_2_avaliacao	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Percepção_segunda

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,236[a]	,056	,052	,86862	1,827

a. Predictors: (Constant), Idade_2_avaliacao
b. Dependent Variable: LN_Percepção_segunda

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12,098	1	12,098	16,034	,000[b]
	Residual	204,471	271	,755		
	Total	216,569	272			

a. Dependent Variable: LN_Percepção_segunda
b. Predictors: (Constant), Idade_2_avaliacao

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,432	,216		6,641	,000
	Idade_2_avaliacao	-,018	,004	-,236	-4,004	,000

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Idade_2_avaliacao	1,000	1,000

a. Dependent Variable: LN_Percepção_segunda

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Masculino_2	-,093[b]	-1,546	,123	-,094	,957
	Casado_2	-,090[b]	-1,441	,151	-,087	,882
	Solteiro_2	,030[b]	,428	,669	,026	,698
	Viuvo_2	,014[b]	,243	,808	,015	,985
	ESCOL_F20	-,003[b]	-,051	,959	-,003	,955
	Prof_superiores_2	,051[b]	,862	,389	,052	,998
	Prof_intermédias_2	-,059[b]	-1,007	,315	-,061	1,000
	Prof_esp_nao_manuais_2	,013[b]	,221	,826	,013	,995
	Prof_semi_qualificadas_2	-,039[b]	-,656	,512	-,040	,998
	Prof_sem_qualificaçao_2	-,046[b]	-,778	,437	-,047	,998

	Alcool_2	,023[b]	,381	,704	,023	,976
	Doença_2	-,088[b]	-1,433	,153	-,087	,919
	Normal_2	-,038[b]	-,616	,538	-,037	,936
	Sobrepeso_2	,032[b]	,530	,597	,032	,932
	Obeso_2	-,006[b]	-,097	,923	-,006	,998
	Horas semanais de trabalho	-,029[b]	-,493	,622	-,030	,981
	DOM_F20	-,032[b]	-,543	,587	-,033	,984
	ALC1_F20	,023[b]	,381	,704	,023	,976
	CIG_F20	-,021[b]	-,353	,724	-,021	,973
	Sono horas/dia	-,101[b]	-1,719	,087	-,104	1,000
	Centro_saude_2	,065[b]	1,103	,271	,067	,995
	Cons_particular_2	-,074[b]	-1,256	,210	-,076	,998
	Cons_hospitalar_2	,077[b]	1,311	,191	,080	1,000
	ALCOHOLCD_F20	,058[b]	,975	,331	,059	1,000
	DO_F20	-,088[b]	-1,433	,153	-,087	,919

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
	Masculino_2	1,045[b]	,957
	Casado_2	1,134[b]	,882
	Solteiro_2	1,433[b]	,698
	Viuvo_2	1,016[b]	,985
	ESCOL_F20	1,048[b]	,955
	Prof_superiores_2	1,002[b]	,998
	Prof_intermédias_2	1,000[b]	1,000
	Prof_esp_nao_manuais_2	1,005[b]	,995
	Prof_semi_qualificadas_2	1,002[b]	,998
	Prof_sem_qualificaçao_2	1,002[b]	,998
	Alcool_2	1,024[b]	,976
	Doença_2	1,088[b]	,919
1	Normal_2	1,068[b]	,936
	Sobrepeso_2	1,073[b]	,932
	Obeso_2	1,002[b]	,998
	Horas semanais de trabalho	1,020[b]	,981
	DOM_F20	1,016[b]	,984
	ALC1_F20	1,024[b]	,976
	CIG_F20	1,027[b]	,973
	Sono horas/dia	1,000[b]	1,000
	Centro_saude_2	1,005[b]	,995
	Cons_particular_2	1,002[b]	,998
	Cons_hospitalar_2	1,000[b]	1,000
	ALCOHOLCD_F20	1,000[b]	1,000
	DO_F20	1,088[b]	,919

a. Dependent Variable: LN_Percepção_segunda
b. Predictors in the Model: (Constant), Idade_2_avaliacao

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions

				(Constant)	Idade_2_avaliacao
1	1	1,970	1,000	,02	,02
	2	,030	8,081	,98	,98

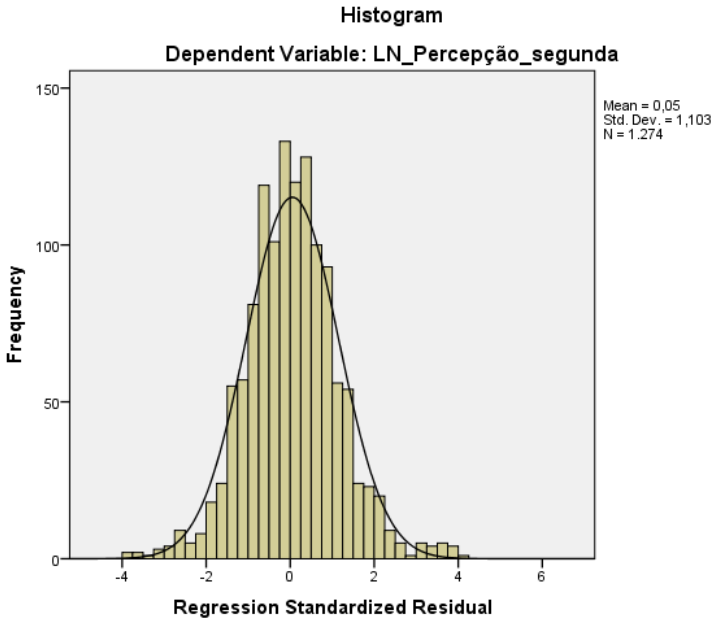
a. Dependent Variable: LN_Percepção_segunda

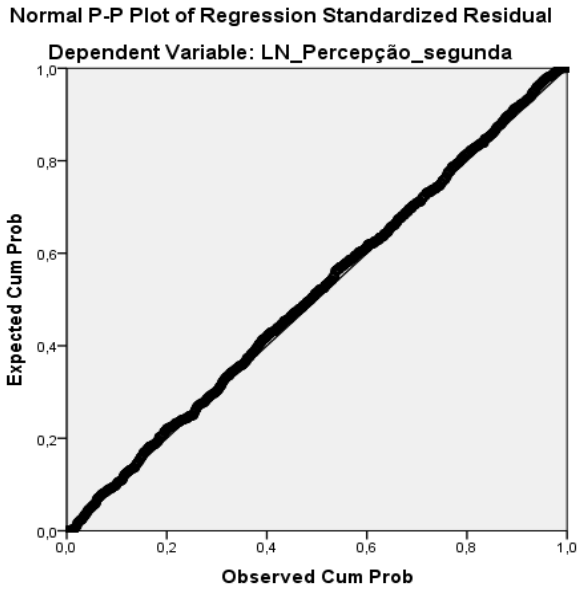
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,2421	1,0721	,4115	,26896	1274
Residual	-3,45846	3,53820	,04488	,95776	1274
Std. Predicted Value	-3,968	2,264	-,869	1,275	1274
Std. Residual	-3,982	4,073	,052	1,103	1274

a. Dependent Variable: LN_Percepção_segunda

Charts





D13. Regression for 36 - 55 years sample, from the 2nd Eval. (Dep. Var. – s)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Idade_2_avaliacao	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
2	Sono horas/dia	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
3	Casado_2	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).
4	Cons_particular_2	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Percepção_segunda

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,238[a]	,057	,051	,88179	
2	,297[b]	,088	,077	,86956	
3	,346[c]	,120	,103	,85717	
4	,403[d]	,162	,141	,83884	1,808

a. Predictors: (Constant), Idade_2_avaliacao
b. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia
c. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2
d. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2, Cons_particular_2
e. Dependent Variable: LN_Percepção_segunda

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7,505	1	7,505	9,653	,002[b]
	Residual	125,186	161	,778		
	Total	132,691	162			
2	Regression	11,711	2	5,855	7,744	,001[c]
	Residual	120,980	160	,756		
	Total	132,691	162			
3	Regression	15,867	3	5,289	7,198	,000[d]
	Residual	116,824	159	,735		
	Total	132,691	162			
4	Regression	21,515	4	5,379	7,644	,000[e]
	Residual	111,177	158	,704		
	Total	132,691	162			

a. Dependent Variable: LN_Percepção_segunda
b. Predictors: (Constant), Idade_2_avaliacao
c. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia
d. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2
e. Predictors: (Constant), Idade_2_avaliacao, Sono horas/dia, Casado_2, Cons_particular_2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,385	,583		4,092	,000
	Idade_2_avaliacao	-,038	,012	-,238	-3,107	,002
2	(Constant)	3,178	,666		4,772	,000
	Idade_2_avaliacao	-,037	,012	-,228	-3,020	,003
	Sono horas/dia	-,116	,049	-,178	-2,358	,020
3	(Constant)	3,664	,687		5,329	,000
	Idade_2_avaliacao	-,040	,012	-,245	-3,276	,001
	Sono horas/dia	-,125	,049	-,193	-2,577	,011
	Casado_2	-,377	,159	-,178	-2,378	,019
4	(Constant)	3,921	,679		5,775	,000
	Idade_2_avaliacao	-,041	,012	-,255	-3,472	,001
	Sono horas/dia	-,125	,048	-,192	-2,630	,009
	Casado_2	-,485	,160	-,229	-3,033	,003
	Cons_particular_2	-,453	,160	-,212	-2,833	,005

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Idade_2_avaliacao	1,000	1,000
2	(Constant)		
	Idade_2_avaliacao	,997	1,003
	Sono horas/dia	,997	1,003
3	(Constant)		
	Idade_2_avaliacao	,988	1,012
	Sono horas/dia	,991	1,009
	Casado_2	,984	1,017
4	(Constant)		
	Idade_2_avaliacao	,986	1,014
	Sono horas/dia	,991	1,009
	Casado_2	,928	1,077
	Cons_particular_2	,943	1,061

a. Dependent Variable: LN_Percepção_segunda

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Idade_2_avaliacao	Sono horas/dia
1	1	1,993	1,000	,00	,00	
	2	,007	16,815	1,00	1,00	
2	1	2,969	1,000	,00	,00	,00
	2	,025	11,001	,03	,16	,87
	3	,006	21,522	,97	,84	,12
3	1	3,771	1,000	,00	,00	,00
	2	,199	4,359	,00	,01	,02
	3	,024	12,486	,03	,18	,85
	4	,006	24,929	,97	,82	,13
4	1	4,029	1,000	,00	,00	,00
	2	,763	2,298	,00	,00	,00

3	,178	4,755	,00	,01	,02
4	,024	12,910	,03	,18	,84
5	,006	25,906	,97	,81	,13

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions	
		Casado_2	Cons_particular_2
1	1		
	2		
2	1		
	2		
	3		
3	1	,01	
	2	,92	
	3	,01	
	4	,06	
4	1	,01	,01
	2	,03	,84
	3	,88	,13
	4	,02	,00
	5	,06	,01

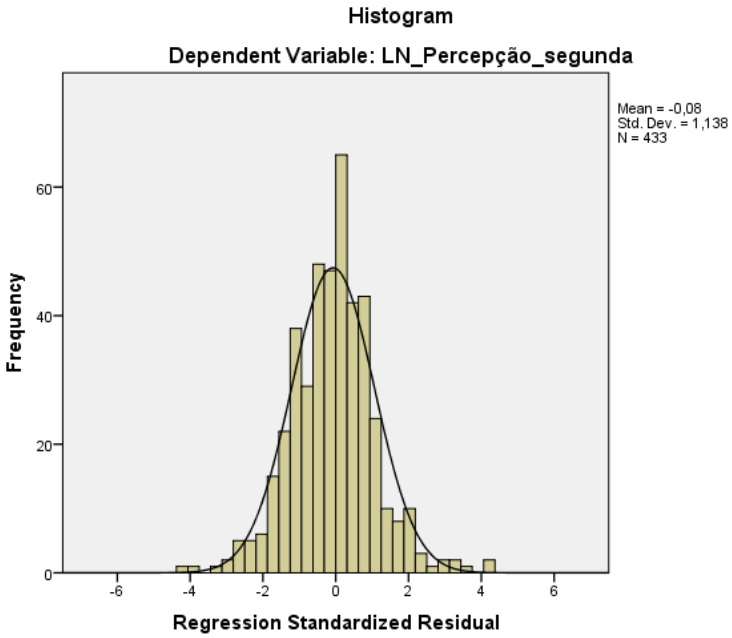
a. Dependent Variable: LN_Percepção_segunda

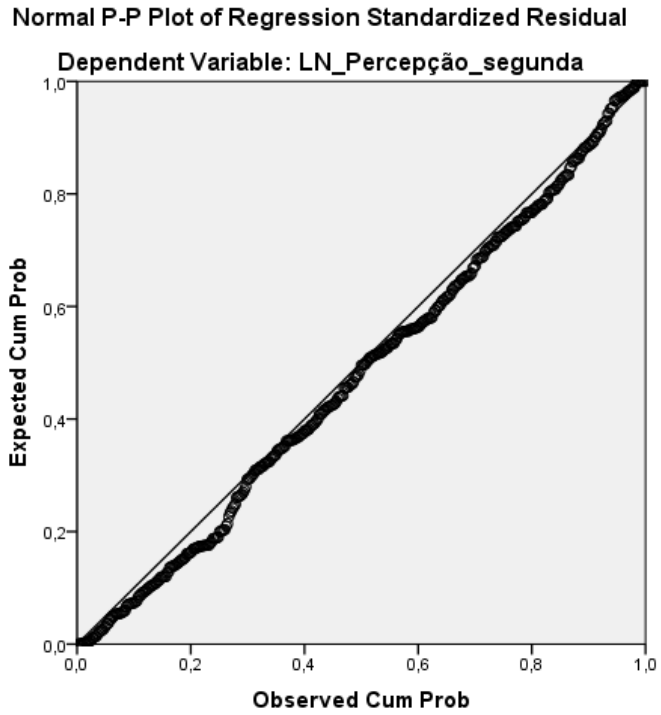
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,4607	1,6466	,5673	,38313	433
Residual	-3,42928	3,57366	-,06327	,95426	433
Std. Predicted Value	-2,874	2,908	-,053	1,051	433
Std. Residual	-4,088	4,260	-,075	1,138	433

a. Dependent Variable: LN_Percepção_segunda

Charts





D14. Regression for > 55 years sample, from the 2nd Eval. (Dep. Var. - *s*)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Doença_2	.	Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100).

a. Dependent Variable: LN_Percepção_segunda

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,310[a]	,096	,080	,79902	1,869

a. Predictors: (Constant), Doença_2
b. Dependent Variable: LN_Percepção_segunda

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,788	1	3,788	5,933	,018[b]
	Residual	35,752	56	,638		
	Total	39,540	57			

a. Dependent Variable: LN_Percepção_segunda
b. Predictors: (Constant), Doença_2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,750	,206		3,637	,001
	Doença_2	-,584	,240	-,310	-2,436	,018

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Doença_2	1,000	1,000

a. Dependent Variable: LN_Percepção_segunda

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Idade_2_avaliacao	,179[b]	1,418	,162	,188	1,000
	Masculino_2	-,073[b]	-,564	,575	-,076	,978
	Casado_2	-,012[b]	-,092	,927	-,012	,989
	Solteiro_2	-,014[b]	-,109	,914	-,015	,994
	Viuvo_2	-,003[b]	-,020	,984	-,003	,989
	ESCOL_F20	-,013[b]	-,103	,918	-,014	,988
	Prof_superiores_2	-,060[b]	-,464	,644	-,062	,990
	Prof_intermédias_2	,229[b]	1,828	,073	,239	,985
	Prof_esp_nao_manuais_2	-,184[b]	-1,459	,150	-,193	,996
	Prof_semi_qualificadas_2	-,047[b]	-,366	,716	-,049	1,000
	Alcool_2	,068[b]	,532	,597	,072	,989
	Normal_2	-,029[b]	-,224	,824	-,030	,995
	Sobrepeso_2	,014[b]	,108	,914	,015	,981
	Obeso_2	,020[b]	,153	,879	,021	,989
	Horas semanais de trabalho	-,195[b]	-1,547	,128	-,204	,989
	DOM_F20	-,141[b]	-1,107	,273	-,148	,996
	ALC1_F20	,068[b]	,532	,597	,072	,989
	CIG_F20	-,116[b]	-,901	,372	-,121	,975
	Sono horas/dia	,121[b]	,952	,345	,127	,996
	Centro_saude_2	,042[b]	,329	,743	,044	,998
	Cons_particular_2	-,008[b]	-,060	,952	-,008	,974
	Cons_hospitalar_2	,087[b]	,682	,498	,092	,994
	ALCOHOLCD_F20	,161[b]	1,273	,208	,169	1,000
	DO_F20	.[b]	.	.	.	,000

Excluded Variables[a]

Model		Collinearity Statistics	
		VIF	Minimum Tolerance
1	Idade_2_avaliacao	1,000[b]	1,000
	Masculino_2	1,023[b]	,978
	Casado_2	1,011[b]	,989
	Solteiro_2	1,006[b]	,994
	Viuvo_2	1,011[b]	,989
	ESCOL_F20	1,012[b]	,988
	Prof_superiores_2	1,010[b]	,990
	Prof_intermédias_2	1,015[b]	,985
	Prof_esp_nao_manuais_2	1,004[b]	,996
	Prof_semi_qualificadas_2	1,000[b]	1,000
	Alcool_2	1,011[b]	,989

	Normal_2	1,005[b]	,995
	Sobrepeso_2	1,020[b]	,981
	Obeso_2	1,011[b]	,989
	Horas semanais de trabalho	1,011[b]	,989
	DOM_F20	1,004[b]	,996
	ALC1_F20	1,011[b]	,989
	CIG_F20	1,026[b]	,975
	Sono horas/dia	1,004[b]	,996
	Centro_saude_2	1,002[b]	,998
	Cons_particular_2	1,026[b]	,974
	Cons_hospitalar_2	1,006[b]	,994
	ALCOHOLCD_F20	1,000[b]	1,000
	DO_F20	.[b]	,000

a. Dependent Variable: LN_Percepção_segunda
b. Predictors in the Model: (Constant), Doença_2

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Doença_2
1	1	1,861	1,000	,07	,07
	2	,139	3,660	,93	,93

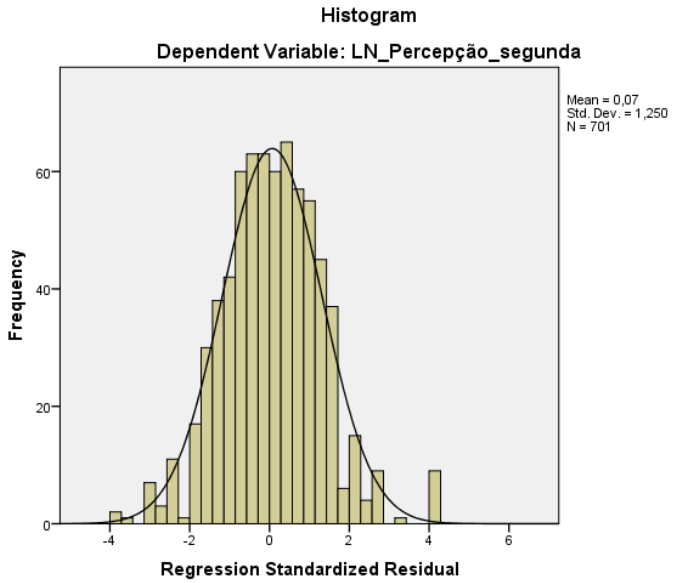
a. Dependent Variable: LN_Percepção_segunda

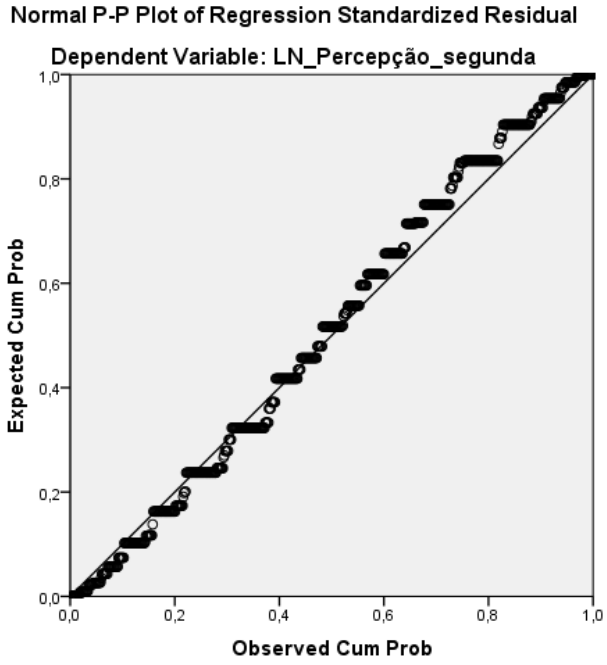
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	,1668	,7504	,2775	,22899	701
Residual	-3,11119	3,30934	,05304	,99862	701
Std. Predicted Value	-,586	1,678	-,156	,888	701
Std. Residual	-3,894	4,142	,066	1,250	701

a. Dependent Variable: LN_Percepção_segunda

Charts





D15. Regression for Full sample for the Difference between Eval. (GHP_{δ})

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Masculino_2, Dif_DORME, Dif_Prof_esp_nao_man, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_semi_qual, Dif_Prof_Intermédias, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Idade, Dif_sobrepeso, Dif_Viuvo, Dif_HT, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Solteiro, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal[b]	.	Enter

a. Dependent Variable: Dif_Percepção_saude
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,190[a]	,036	,002	9,702	,082

a. Predictors: (Constant), Masculino_2, Dif_DORME, Dif_Prof_esp_nao_man, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_semi_qual, Dif_Prof_Intermédias, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Idade, Dif_sobrepeso, Dif_Viuvo, Dif_HT, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Solteiro, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal
b. Dependent Variable: Dif_Percepção_saude

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2115,065	21	100,717	1,070	,376[b]
	Residual	56479,881	600	94,133		
	Total	58594,946	621			

a. Dependent Variable: Dif_Percepção_saude
b. Predictors: (Constant), Masculino_2, Dif_DORME, Dif_Prof_esp_nao_man, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_semi_qual, Dif_Prof_Intermédias, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Idade, Dif_sobrepeso, Dif_Viuvo, Dif_HT, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Solteiro, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	32,655	15,736		2,075
	Dif_Idade	-,080	,155	-,022	-,513
	Dif_Solteiro	-,269	1,238	-,009	-,217
	Dif_Viuvo	-1,468	1,481	-,041	-,991
	Dif_Normal	-5,456	7,047	-,274	-,774
	Dif_sobrepeso	-5,735	7,082	-,285	-,810
	Dif_Obeso	-7,257	7,104	-,318	-1,021
	Dif_Escolaridade	-,012	,360	-,001	-,032
	Dif_Prof_Superiores	,657	1,255	,023	,524
	Dif_Prof_Intermédias	-2,294	1,931	-,049	-1,188
	Dif_Prof_esp_nao_man	-2,301	1,573	-,061	-1,463
	Dif_Prof_semi_qual	2,986	2,365	,052	1,263
	Dif_Prof_sem_qualif	-,962	3,021	-,013	-,318
	Dif_HT	,029	,027	,046	1,092
	Dif_DOMESTICOS	-1,688	1,321	-,056	-1,278
	Dif_AFTOTAL	-,003	,002	-,063	-1,534
	Dif_ALCOOL	-1,802	1,138	-,066	-1,583
	Dif_DORME	-,015	,385	-,002	-,038
	Dif_centrosaude	-,480	,892	-,025	-,538
	Dif_consult_particular	-1,799	1,415	-,056	-1,272
	Dif_consult_hospitalar	-3,338	2,783	-,049	-1,199
	Masculino_2	1,870	,900	,093	2,079

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,038		
	Dif_Idade	,608	,886	1,128
	Dif_Solteiro	,828	,845	1,184
	Dif_Viuvo	,322	,917	1,090
	Dif_Normal	,439	,013	78,107
	Dif_sobrepeso	,418	,013	77,086
	Dif_Obeso	,307	,017	60,472
	Dif_Escolaridade	,974	,959	1,043
	Dif_Prof_Superiores	,601	,840	1,191
	Dif_Prof_Intermédias	,235	,944	1,059
	Dif_Prof_esp_nao_man	,144	,931	1,074
	Dif_Prof_semi_qual	,207	,963	1,038
	Dif_Prof_sem_qualif	,750	,954	1,048
	Dif_HT	,275	,924	1,083
	Dif_DOMESTICOS	,202	,848	1,180
	Dif_AFTOTAL	,125	,960	1,042
	Dif_ALCOOL	,114	,927	1,079
	Dif_DORME	,969	,953	1,049
	Dif_centrosaude	,591	,761	1,313
	Dif_consult_particular	,204	,843	1,187

	Dif_consult_hospitalar	,231	,955	1,047
	Masculino_2	,038	,797	1,255

a. Dependent Variable: Dif_Percepção_saude

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4,35	18,15	11,37	1,846	622
Residual	-14,863	43,100	,000	9,537	622
Std. Predicted Value	-3,804	3,672	,000	1,000	622
Std. Residual	-1,532	4,442	,000	,983	622

a. Dependent Variable: Dif_Percepção_saude

D16. Regression for Full sample for the Difference between Eval. (s_δ)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Masculino_2, Dif_Prof_esp_nao_man, Dif_DORME, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_Intermédias, Dif_Prof_semi_qual, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Solteiro, Dif_HT, Dif_sobrepeso, Dif_Viuvo, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Idade, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal[b]	.	Enter

a. Dependent Variable: DIF_percepção_LN
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,251[a]	,063	,026	,84176	,143

a. Predictors: (Constant), Masculino_2, Dif_Prof_esp_nao_man, Dif_DORME, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_Intermédias, Dif_Prof_semi_qual, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Solteiro, Dif_HT, Dif_sobrepeso, Dif_Viuvo, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Idade, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal
b. Dependent Variable: DIF_percepção_LN

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25,094	21	1,195	1,686	,029[b]
	Residual	372,701	526	,709		
	Total	397,795	547			

a. Dependent Variable: DIF_percepção_LN
b. Predictors: (Constant), Masculino_2, Dif_Prof_esp_nao_man, Dif_DORME, Dif_consult_hospitalar, Dif_Escolaridade, Dif_Prof_Intermédias, Dif_Prof_semi_qual, Dif_AFTOTAL, Dif_Prof_sem_qualif, Dif_consult_particular, Dif_Solteiro, Dif_HT, Dif_sobrepeso, Dif_Viuvo, Dif_ALCOOL, Dif_Prof_Superiores, Dif_Idade, Dif_DOMESTICOS, Dif_centrosaude, Dif_Obeso, Dif_Normal

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	,674	1,384		,487

	Dif_Idade	-,033	,014	-,103	-2,290
	Dif_Solteiro	-,135	,116	-,054	-1,164
	Dif_Viuvo	-,278	,137	-,090	-2,031
	Dif_Normal	-,853	,614	-,488	-1,388
	Dif_sobrepeso	-,928	,617	-,522	-1,503
	Dif_Obeso	-1,075	,619	-,544	-1,736
	Dif_Escolaridade	-,022	,033	-,028	-,657
	Dif_Prof_Superiores	,035	,117	,014	,300
	Dif_Prof_Intermédias	-,121	,169	-,031	-,720
	Dif_Prof_esp_nao_man	-,128	,140	-,040	-,916
	Dif_Prof_semi_qual	,198	,219	,039	,907
	Dif_Prof_sem_qualif	,038	,263	,006	,146
	Dif_HT	,004	,003	,062	1,420
	Dif_DOMESTICOS	-,083	,123	-,031	-,675
	Dif_AFTOTAL	,000	,000	-,044	-1,019
	Dif_ALCOOL	-,294	,104	-,124	-2,813
	Dif_DORME	,040	,036	,048	1,122
	Dif_centrosaude	,013	,083	,007	,152
	Dif_consult_particular	-,192	,131	-,068	-1,465
	Dif_consult_hospitalar	-,284	,243	-,051	-1,171
	Masculino_2	,157	,083	,089	1,902

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	,626		
	Dif_Idade	,022	,881	1,135
	Dif_Solteiro	,245	,831	1,203
	Dif_Viuvo	,043	,917	1,090
	Dif_Normal	,166	,014	69,421
	Dif_sobrepeso	,134	,015	67,876
	Dif_Obeso	,083	,018	55,067
	Dif_Escolaridade	,511	,955	1,047
	Dif_Prof_Superiores	,765	,852	1,174
	Dif_Prof_Intermédias	,472	,937	1,068
	Dif_Prof_esp_nao_man	,360	,931	1,074
	Dif_Prof_semi_qual	,365	,955	1,047
	Dif_Prof_sem_qualif	,884	,949	1,054
	Dif_HT	,156	,928	1,077
	Dif_DOMESTICOS	,500	,840	1,190
	Dif_AFTOTAL	,309	,948	1,055
	Dif_ALCOOL	,005	,915	1,093
	Dif_DORME	,263	,959	1,043
	Dif_centrosaude	,880	,756	1,323
	Dif_consult_particular	,144	,832	1,201
	Dif_consult_hospitalar	,242	,947	1,055
	Masculino_2	,058	,804	1,243

a. Dependent Variable: DIF_percepção_LN

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-3,0297	-1,4108	-2,1582	,21419	548
Residual	-2,43734	2,33864	,00000	,82544	548
Std. Predicted Value	-4,069	3,489	,000	1,000	548
Std. Residual	-2,896	2,778	,000	,981	548

a. Dependent Variable: DIF_percepção_LN

Explore

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,106	548	,000	,888	548	,000
Standardized Residual	,039	548	,043	,996	548	,256

a. Lilliefors Significance Correction